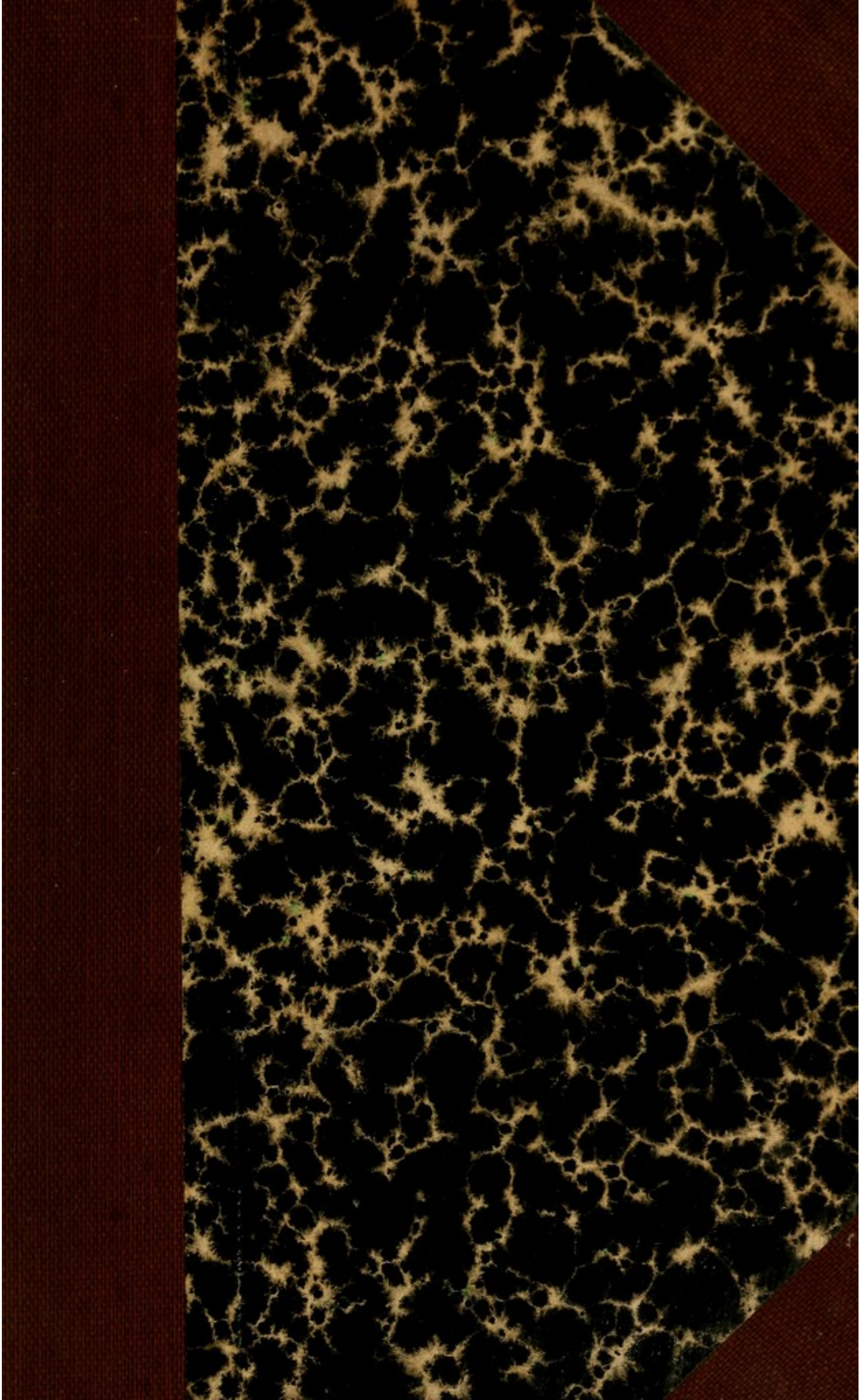
A treatise on cholera : containing the author's experience of the epidemic known by that name, as it prevailed in the city of Moscow in autumn 1830 and winter 1831 / by James Keir.



A TREATISE ON CHOLERA,

CONTAINING

THE AUTHOR'S EXPERIENCE OF THE EPIDEMIC KNOWN BY THAT NAME,

AS IT PREVAILED IN

THE CITY OF MOSCOW

IN AUTUMN 1830, AND WINTER 1831.

By JAMES KEIR, M.D.

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"Quod si jam incidat mali genus aliquod ignotum, non ideo tamen fore medico de rebus cogitandum obscuris; sed eum protinus visurum, cui morbo id proximum sit; tentarumque remedia similia illis, quæ vicino malo sæpe succurrerint, et per ejus similitudinem opem reperturum."—CELSUS.

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TO HIS EXCELLENCY

SIR JAMES WYLIE, BARONET,

PRIVY-COUNCILLOR, AND ONE OF THE PHYSICIANS

OF

HIS IMPERIAL MAJESTY THE EMPEROR OF RUSSIA,

INSPECTOR-GENERAL OF THE MEDICAL DEPARTMENT
OF THE RUSSIAN ARMY,

PRESIDENT OF THE IMPERIAL MEDICO-CHIRURGICAL ACADEMY,
&c. &c.

KNIGHT OF MANY ORDERS,

THIS TREATISE

IS RESPECTFULLY INSCRIBED,

AS S SMALL MARK OF REGARD AND ESTEEM,

BY HIS FRIEND,

THE AUTHOR.

PREFACE.

MANY excellent writings are already before the public on the disease which is the subject of this treatise, and to some it may perhaps appear superfluous to have committed the present to the press. My reasons for doing so are, first, that few, if any, publications of the same kind, as far as I know, have yet appeared on this disease, since the prevalence of the present epidemic in Europe; secondly, the interest which the subject must naturally everywhere excite; and thirdly, the belief that any remarks on a disease of such interest, made by one who is growing grey in the study and exercise of a profession to which he has devoted his life, remarks founded on no preconceived notions, nor attachment to particular opinions, but communicated as the sum of his observation and practice, and as the result of his inquiries in search of truth, are sure of a candid hearing.

I do not pretend to bring forward any thing new, but I trust that this Treatise may be found to exhibit a connected exposition of the disease as a whole, in its idiopathic, accidental, and epidemic forms; a rational theory, and sound principles of practice.

With the hope that it may be found useful to those whose lot it may yet be to treat this disease, and with the heart-felt wish that it may contribute to save the lives or alleviate the sufferings of humanity, I commit it to the judgment of my enlightened brethren.

Moscow, 4–16 *October*, 1831.

TABLE OF CONTENTS.

ON CHOLERA IN GENERAL.

PART I.

CHAPTER I.

CHAPTER II.

CHAPTER III.

CHAPTER IV.

ON THE PRESENT EPIDEMIC DISEASE

KNOWN BY THE NAME OF

INDIAN OR EPIDEMIC CHOLERA.

PART II.

CHAPTER V.

CHAPTER VI.

CHAPTER VII.

CHAPTER VIII.

CHAPTER IX.

CHAPTER X.

ON THE CAUSE AND NATURE OF THE DISEASE.

CHAPTER XI.

MORBID APPEARANCES IN THE DEAD BODY.

CHAPTER XII.

PROPHYLAXIS.

CHAPTER XIII.

TREATMENT.

ON CHOLERA IN GENERAL.

PART I.

CHAPTER I.

SECT. I.—*Derivation of the word Cholera.*—The word, or name of χολερα when applied to signify a disease, seems to have been used by the ancient Greek and Roman medical writers, to distinguish a complaint, of which the most prominent symptoms were, a frequent bilious vomiting and purging: thus Celsus writes:

"Primo aeque facienda mentio est Cholerae, quia commune id stomachi atque intestinorum vitium videri potest. Nam simul et dejectio, et vomitus est, praeterque haec inflatio est, intestina torquentur, *bilis* supra infraque erumpit, primum *aquae similis*, deinde ut in ea recens caro lota esse videatur, interdum *alba*, nonunquam nigra vel varia; *ergo eo nomine* morbum hunc χολεραν Graeci nominarunt."*

* Aurelii Cornel. Celsi liber quartus, de intestinorum morbis. Haganoae, anno 1528.

And Caelius Aurelianus, " Cholericam passionem aiunt aliqui nominatam, a fluore fellis per os atque ventrem effecto, veluti fellifluam passionem. Nam χολην fel appellant, ῥοιὰν* fluorem: alii a multitudine fluentium humorum qui sunt similes felli. Non enim inquiunt esse fella, sed esse liquida in eundem colorem transeuntia: sed hoc differt nihil."†

Gregorius Horstius says: " Malum hoc, sat acutum et periculosum, cholera, vel cholerica passio, τα χολερικὰ juxta Hippocratem, απο της χολης, a bilis et biliosi humoris rejectione dicitur, quanquam Alexander Trallianus, liber vii. cap. 14, aliam nominis derivationem habet, dum inquit: ne autem quis affectum ideo choleram vocari putet, quod a bile omnino fieri consuevit, sed quia materia, quae per ventrem adfertur ex intestinis videtur excerni: intestina vero χολάδες veteres appellabant, ut etiam Homerus testatur his verbis κεχυνου χαναὶ χολάδες, hoc est, fusa erant humi intestina."‡

Nicolaus Piso tells us: " Ea nomen sumpsit a causa putata, nempe bile, quae per eam affectionem copiose effunditur. Vel sic dicta est (ut alii

* Potius ῥοὴν, nam ῥοια non nisi in compositis, ut διάῤῥοια, γονορροια, &c. usurpatur. Note of Editor.

† Caelius Aurelianus Siccensis de morbis acutis et chronicis. Acutorum morborum, liber iii. cap. 19.

‡ Gregorii Horstii Centuriae Problematum Θεραπευτικῶν Decas 5, de cordis et ventriculi affectibus, Quaestio vi. p. 67. Amstelodami, 1661.

censent), quia materia quae per ventrem effertur, ex intestinis excerni videtur, quae a Graecis χολαδες nominantur."*

The greater number of the ancient writers, however, rather follow the derivation of the name from χολη or χολερα bilis.

Castellus writes, "Nomen habet non tam a χολη, quam a χολας, *i. e.* intestinum, per quod materia ex ventre excernitur. Haec quondam Castellus de hoc affectu. Quibus alia *clariora* et *accuratiora* annectemus. Cholera morbus rectius derivatur a χολη, quam ἀπὸ τῶν χολαδων, uti voluit Trallianus."†

Sect. II.—*What the ancients understood by the disease called Cholera.*—Although Hippocrates mentions this disease in different parts of his works, and treats of it briefly in his epidemics, it is pretty evident that he had not often seen or treated the complaint. In the whole of his works (if I do not mistake) he only gives three cases of it, and he nowhere speaks of it as a severe and fatal epidemic, which so accurate an observer of nature, as he is allowed to be, would surely have done, had he met with the opportunity; he gives no definition of the disease, but on putting together and comparing all that he has written

* Nicolai Pisonis de cognoscendis et curandis morbis, liber iii. cap. 13, p. 70. Lugduni Batavorum, 1736.

† Bartholomaei Castellii Lexicon Medicum. Genevae, 1746.

upon it, one may conclude, that he understood by the disease χολερα, in the words of his commentator Foesius, "Cholera morbus, ventris perturbatio immodica, per quam bilis per vomitum et secessum excernitur."*

Sect. III.—*Division of the disease by Hippocrates, Galen, and Sydenham, into Cholera humida and Cholera sicca.*—Hippocrates has described two forms or species of this disease, Cholera humida, et sicca. "In cholera sicca," he says, "venter inflatur, et strepitus insunt, et laterum ac lumborum dolor, nihilque infra dejicit alvus, sed astringitur," &c. et porro "At si alvus liquida fuerit, et bilis subducatur, torminaque vexent, vomitiones et suffocationes, iis optimum est quiescere, aquam mulsam bibere, ac minime vomere. Hydropum cum duae sint naturae hic quidem qui hyposarcidios (velut sub carne) dicitur, ubi hominem aggreditur evitari non potest. Alter vero cum flatibus multam felicitatem ad curationem requirit, præcipueque multos labores, fotum, et temperantiam. Sicca edat et acria, nempe cum hac ratione plurimam urinam reddat et maxime viribus valeat."† Commentator Foesius anno-

* Anutii Foesii Œconomia Hippocratis, p. 409, ad vocabulum χολερα ad finem Foesii Opera Hippocratis. Genevae, 1657.

† Hippocrates de ratione victus in morbis acutis, opus supra citatum, p. 405.

tat: "χολερη duplex statuitur Hippocrati, humida, et sicca, verum χολερη simpliciter dicta, choleram humidam indicat, quae fit ab acribus, *serosis* et *biliosis humoribus*, qui ex acrium ciborum corruptione generantur. Sic enim scribit Hippocrates carnes caprinas choleram gignere. Et rursus, porcinas carnes χολωδεις esse scribit, hoc est ut exponit Galen, χολερας ποιητικας, ob eam quam habent acrimoniam. Choleram namque gignunt humida, et acria alimenta, quae statim corrumpuntur, acresque succos pariunt, qui vellicant, et mordent viscerum ora, quae ad ventriculum pertinent, itaque fluxionem ex toto corpore irritant, qua biliosa et acria, vomitu, et dejectione educuntur, ut ibidem scribit Galenus in Commentariis. Cholera vero sicca dicitur, quae fit ex spiritu flatuoso et acri, in ventriculo collecto, qui nervosa corpora quae sunt circa ventriculum intercipit, vellicat, et extendit; unde fit quaedam imago cholerae humidae." (et dein) "Atque ibi Galenus optime utriusque cholerae differentiam statuit his verbis. Choleram hominibus simpliciter dictam ab arida, per humiditatem distinguit, in utraque autem communi nomine est usus, communem generationis modum spectans. Quemadmodum enim cholera humida ex acribus oritur humoribus, qui ex eduliorum corruptione originem sumpserunt, sic arida, ex spiritu flatuoso acri. Ideoque proxima ventri nervosa cor-

pora ubi mordentur, et distenduntur, dolorem faciunt."

Sydenham says, " Est etiam et cholera sicca a spiritu flatuoso supra et infra erumpente, idque sine vomitu vel secessu, cujus unicum duntaxat exemplum me vidisse memini, ineunte hujus anni autumno 1669, quo tempore prior illa species (humida) creberrime, et facto quasi *agmine* sese obtulit."

Aretaeus has well described this disease, but his description applies to the disease as it appears from time to time in different parts of Europe, rather as a sporadic, than epidemic complaint.

Sect. IV.—*Its epidemic nature.*—Finally Sydenham, with his usual fidelity, distinctly marks the epidemic nature of the disease. " Cholera Morbus," he says, " ex epidemicorum autumnalium familia, mense Augusto exorsus, intra angustos unius mensis cancellos conclusus, percurrit sua tempora."* He mentions two years when this disease seems more particularly to have attracted his attention, namely, 1669 and 1676, " Morbus hic (Cholera) qui ut antea diximus anno 1669 se latius diffuderat quam alio quovis anno, quantum ego observaveram, eam anni partem quae aestatem fugientem, atque autumnum

* Sydenhami Opera Medica, de Morbis epidemicis. Genevae, 1757, tomus primus, p. 23.

imminentum complectitur, unice, ac eadem prorsus fide qua veris primordia hirundines, aut insequentis tempestatis fervorem cuculus amare consuevit," &c.

SECT. V.—*Ancient names of the disease and of the sick.*—When the ancients speak of this disease, they name it χολερα, or passio cholerica, and Pliny calls it χολεραs. "Choleram Latini dicunt etsi saepe choleras vocat Plinius."* Caelius Aurelianus calls the sick Cholerici, the Greek writers, Choleriontes.

Sydenham seems to be one of the first writers who names the disease *Cholera Morbus*, probably to distinguish it from χολερα in the singular signifying bile. Nicolas Piso says, "Cholera etiam numero singulari significat bilem, sed χολερα χολερων, plurali, vitium est ventris, malumque mirifice praeceps."

SECT. VI.—*Case of the disease by Hippocrates, and description by Aretaeus and Caelius Aurelianus.*—The following case, transcribed from the works of Hippocrates will enable us to judge what he understood by the disease.

"Quidam Athenis Cholera correptus tum vomebat, tum infra demittebat, et doloribus conflictabatur, ac neque vomitio, neque alvi dejectio sisti poterat, voxque defecerat, nec lecto moveri

* Vide Foesi Commentaria in Opera Hippocratis, p. 1145. A.

poterat, oculi caligine obducti et cavi, convulsiones detinebant, quae ab intestinis profectae, ventriculum occupabant, et singultus. Quod ex alvo secedebat vomitione longe copiosius erat. Hic epoto veratro cum lenticulae succo, etiam insuper alterum lenticulæ succum pro viribus ebibit, ac tandem post vomitum, ei ambo coacta sunt, et suppressa, verum perfrigescebat. At calida admodum multa lotus est, a pudendis deorsum, in tantum ut etiam superiora incalescerent, et vixit, postridie vero polentam sumpsit."

The description of the disease by Aretaeus is short, but clearly expressed and well written.

" Cholera est materiae a toto corpore in gulam, ventriculum, et intestina *retro fluens motio*, vitium acutissimum. Supra enim per vomitum erumpunt quae in ore ventriculi et gula congestae fuerant. Infra dejiciuntur humores in ventriculo intestinisque natantes. In primis quae evomuntur *aquae similia sunt ;* quae anus effundit, stercorea, liquida, tetrique odoris sentiuntur. Siquidem longa cruditas id malum excitavit, quae si per clysterem eluantur, primo *pituitosa, mox biliosa feruntur*. Initio quidem facilis morbus est dolore vacans : postea vero tensiones in ore ventriculi et gula, tormina in ventre nascuntur. Si magis saeviat morbus, et tormina augescant, anima deficit, membra resolvuntur, cibos exhorrent, animus consternatur. Si quid acceperint, cum magno tumultu, nausea et vomitus invadit,

tum sincera flava bilis expellitur: dejectiones quoque similes sunt. Nervi tenduntur, tibiarum brachiorumque musculi convelluntur, digiti incurvantur, vertigo oboritur, singultiunt, ungues livent: algent extrema: totum corpus rigore concutitur. Si malum ad ultimum venit, tum vero aegrotus sudore profunditur, bilis atra, supra infraque prorumpit, convulsione impedita vesica, lotium cohibetur; quod tamen cum in intestinis humores deriventur, abundare non potest: voce privantur: arteriarum pulsatus minimi sunt ac frequentissimi: cujusmodi in syncope proposuimus, conatus ad vomendum perpetui ac inanes fiunt: inclinatio ad dejiciendum prompta, quam tenesmon Graeci vocant: sicca tamen, nihilque succi egerens: mors demum sequitur doloribus plena, et miseranda per convulsionem strangulatam, et inanem vomitum. Id genus maxime aestati grassari consuevit, secundo per autumnum, minus vere, hiberno tempore minime. Inter aetates autem juventa, et ea quae robustior est, hoc fere corripiuntur: senecta rarissime: pueri magis, quam senes, sed non mortifere."

Caelius Aurelianus describes the symptoms of the disease as follows :—

" Praecedit frequenter cholericos, stomachi gravedo, atque tensio: anxietas, jactatio, vigiliae, tormentum intestinorum cum sonitu, quem Graeci borborysmon vocant. Ventris dolor, atque per podicem venti fluor nihil relevans; ruc-

tationes fumosae, nausea, salivarum fluor, gravedo thoracis, cum membrorum defectu; surgente passione jugis vomitus et primo corrupti cibi, sicut frequenter occurrit, et humoris atque fellis floridi, dehinc vitellis ovorum similis, tunc prasii atque aeruginosi, ultimo etiam nigri; ventris quoque turbatio cum dolore, et egestio vomitorum similis, hoc est spumosa et acerrima cum frequente delectatione vomendi. Crescente passione aquati atque tenuis liquoris fit egestio, et aliquando similis loturae carnis. Feruntur etiam cum his humoribus plerumque subalbida desputa, sequitur etiam densitas pulsus, et articulorum frigus, atque vultus nigrore fuscatus, ardor atque sitis insatiabilis, spiratio celerrima, et contractio, vel conductio membrorum, cum nervorum tensione, ac surarum et brachiorum. Praecordiorum etiam ad superiora raptus, cum dolore iliaco simili, aliquando etiam egestio ventris sanguinolenta, vultus in maciem atque tenuitatem deducti, oculi *rubri*, et in ultimo singultus. Ista denique acuta atque celerrima passio esse, a veteribus memoratur ut nunquam in secundum veniat diem. At si in meliorem partem vergere caeperit, ut levior fiat, articulorum atque corporis frigus infractum mitescit, et pulsus assurgens manifestior fit, ex altioribus ad superficiem veniens, parvae etiam, atque intervallis longioribus egestiones fiunt, et paulatim relevatior aeger efficitur. Accessiones autem apprehendimus, ex his quae sunt passioni

consequentia. Cum enim anxietas atque jactatio confluentibus ad stomachum liquidis, et contractio articulorum occurrerit, accessionem praesentem dicimus. At si post vomitum, minus sibi aeger caeperit displicere, stomachi occurrerit relevatio, et mitigata ventris mordicatione, cuncta minui adversa caeperint, dimissionem pronuntiamus. Generaliter autem passio est vehemens, atque acuta vel celeris, et aliquando solius solutionis, aliquando adjuncta ex aliqua parte strictura, ut dolores ostendunt stomachi, atque ventris, et intestinorum, et articulorum contractio. Magis autem patiuntur in ista passione stomachus et venter et intestina, caetera vero membra omnia corporis consentiunt."*

Sect. VII.—*Description of the Epidemic Cholera of* 1669, *by Sydenham.*—It will not be superfluous to insert in this place the description of the epidemic cholera of 1669, by Sydenham, since he of all the older writers has the most distinctly described the disease as an epidemic. I shall therefore continue what I have already quoted from this celebrated observer of epidemics.

" Qui ab ingluvie aut crapula, nullo temporis discrimine passim excitatur affectus, ratione symp-

* Caelius Aurelianus Siccensis de morbis acutis et chronicis, acutorum morborum, liber iii. cap. 20. Amstelodami, clo lo cc xxii.

tomatum non absimilis, nec eandem curationis methodum respuens, tamen alterius est subsellii. Malum ipsum facile cognoscitur, adsunt enim vomitus enormes, ac pravorum humorum cum maxima difficultate, et angustia per alvum dejectio ; ventris ac intestinorum dolor vehemens, inflatio, et distensio ; cardialgia, sitis, pulsus celer ac frequens, cum aestu et anxietate, non raro etiam parvus et inaequalis ; insuper et nausea molestissima, sudor interdum diaphoreticus, crurum et brachiorum contractura, animi deliquium, partium extremarum frigiditas, cum aliis consimilis notae symptomatis, quae astantes magnopere perterrefaciant, atque etiam angusto viginti quatuor horarum spatio aegrum interimant."

Sect. VIII.—*Description of Cholera by Nicolas Piso and Frederick Hoffman.* Among the honoured and esteemed writers of the two last centuries, I must not pass over in silence what Nicolas Piso and Frederick Hoffman have left us on Cholera. Piso writes thus :

" Ut in explicandis ventriculi et intestinorum affectibus progressum faciamus, ad χολεραν Graecis dictam (vulgo Cholericam) transibimus. In qua ventriculus superno, infernoque ore ad excernendum utens, ab aliquo quod morsu, vel pondere contristat, divexatur. Ea nomen sumpsit a *causa putata* nempe *bile*, quae per eam affectionem copiose effunditur. Vel sic dicta est (ut alii censent) quia materia quae per ventrem effertur,

ex intestinis excerni videtur, quae a Graecis χολαδες nominantur." "Est autem Cholera immoderata perturbatio, quae per alvum, et vomitum, propter stomachi subversionem, offensionemque provenit. Seu cholera affectus est acutus, et *fere sine febre* cum vomitibus multis, alvique dejectionibus. Vel brevius cholera est bilis, tum superne, tum inferne eruptio. Porro non ita liquet quaenam pars in ea afficiatur, cum dicit Celsus, commune esse id vitium stomachi et intestinorum, in quo simul vomitus adsit, et dejectio, seu inter stomachum et intestina versari.

"Sed potius dicendum ventriculum affici secundum totum (non secundum superiorem aut inferiorem partem) cui coafficiuntur stomachus, seu gula, et intestina, in quibus inflatio est, ut dicitur.

"Est autem depravatus motus expultricis, ut nausea, et vomitus. Ac proinde symptoma est in genere noxae facultatum naturalium, et propriae expultricis depravatae. Quanquam fit interdum citra ejusdem facultatis noxam. Perpetuo tamen aliquem affectum praeter naturam consequitur.

"Verum haud ita proprie nominant Choleram, ut si fiat propter ciborum qualitatem. *Pluribus* enim ex *causis* Cholera oritur, quas ut diligentius exponamus, duplicem ex Hippocrate Choleram, aridam videlicet et humidam efferemus. Ac

quamvis in utraque immoderata est ventriculi perturbatio, differunt causa et symptomate. Arida enim fit ex flatuoso spiritu, qui sive excernatur, sive retineatur, partes nervosas lancinat, ac mordicat. Et arida Cholera ventrem inflat, strepitum et doloren tum laterum, tum lumborum excitat, alvus nihil dejicit, sed astringitur. Nervaceae partes ab illo spiritu vellicantur, ut utrumque orificium ventriculi unde fiunt duo motus contrarii, naturae valde molesti, quare crura et manus contrahuntur, animaque deficit. Humida vero Cholera gignitur, *ab humoribus, vel alimentis, vel medicamentis.* Nam ob pravorum humorum, ac ciborum, seu potionum, stomachum offendentium qualitatem, *bilis si adest*, naturam sursum ac deorsum ad excernendum irritat. Alimenta quoque, succum crudum flatuosum procreant, acrem, et facile putrescibilem, quae scilicet aegre coquuntur, et tarde permeant, ut intestina suilla infarcta sanguine, caepis, pipere, pinguedine, caseo, suilla caro, bubula, caprina, ventres animalium infarcti, boleti, ova frixa, et quae humiditatem acrimoniae conjunctam habent, ut pepones, mala armeniaca, chrysomata cucurbita. Corrumpuntur haec facile, et acrimonia, fluxiones irritant ex toto corpore, mordicantes orificia vasorum quae ad ventrem pertinent, unde vomitus ac dejectio. Quo loco etiam animadvertendum est, alimenta facile corrumpi in corporibus intemperatis, quae coquuntur

facile in temperatis, ut dulcia, quae excitandae cholerae apta sunt. Cum enim hic morbus fiat ex corruptione alimentorum, corrumpuntur etiam bona alimenta ob intemperiem ventriculi calidam, et humores in eo contentos, maxime ob bilem. Alia est causa corruptionis eorum a quibusdam allata, quia eo ordine non est assumptus cibus quo debebat, ut cucurbita facile putrescit, si aliis cibis misceatur, sic et pepones, et melopepones. Porcelli quoque carnes Choleram pariunt, et turbationem, quia humidae, acres, et choleracae. Excitant et hunc affectum Medicamenta, quae sua natura vomitum cient, et ad ventriculum trahunt excrementa, ut helleborus, colocynthis, scammonium, et reliqua violenta pharmaca, ex quibus aliquando generatur convulsio, aut immoderata purgatione, aut nervorum substantia resiccata, aut demorso ore ventriculi, nervis laborantibus per consensum, ab aeruginosa bile : aliquando etiam Cholera sequitur quia mordentur partes nervosae vi medicamenti, et acrimonia humoris attracti, a cujus quantitate ventriculus potest comprimi, idque cum humores non sunt ad purgationem parati. Et cholera fit aliquando ex toto corpore, aliquando ex quibusdam partibus, ut hepate, et huic maxime familiares sunt contractiones in musculis, et pulpis tibiarum, quas contractiones vulgo crampas appellant. A liene etiam, mesenteria, capite, fluit humor, propter aliquas causas externas vel inter-

nas. Frigida etiam applicata Choleram gignunt, aut frigidarum aquarum usus, si eas biberint aut in eis diutius nataverint; et de causa Cholerae sic quidam inter recentiores. Cholerae causa est bilis, quae tempore in suo folliculo, vel in jecore, vel in liene, vel circum pancreas, vel circum intestina, stomachumque cumulatur; cumque supra modum aucta, naturae gravis et infesta esse caeperit, huc illuc impellitur, ac diffluit, ut etiam ea perculsi *toxicum* se bibisse putant.

" *Signa.*—Cholerae indicia sunt ventriculi et intestinorum morsus, quem sequitur fluxus ventris, et vomitus variorum excrementorum. Aut vomitus biliosus est, ac nidorosus, vel acidus, ad plures horas perseverans continue. Venter inferne eadem excernit. Sequitur sitis, animi deliquium, frigidae sudationes, pulsus celer, frequens, parvus atque concisus. Musculorum manuum ac pedum maxime vero surarum contractio, et tensio, et *nedum bilis supra infraque erumpit, sed primum aquae similis dejectio est*, deinde ut in ea recens caro lota esse videatur, *interdum alba*, nonunquam nigra, vel varia. Vel juxta alios supra, infraque, magno impetu prorumpit primum liquidior, pallida, et flava, dein crassior, majoremque colorem exhibens, flavum, prassinum, coeruleum, aut etiam nigrum. Circa umbilicum fiunt torsiones quas Graeci στροφους vocant, seu distensiones ex flatibus in ventre collectis, teste Alexandro. Ubi cholera excitata est ex-

copia bilis, seu aliorum humorum pravorum redundantia, ex propriis humorum dictorum signis colliges.

" Si alimentorum assumptorum ac etiam potionum copiam, aut pravam qualitatem sequitur, ex laborantis, vel assidentium sermone percipies; velut etiam si usus rerum frigidarum, aut frigidorum medicamentorum ad extra adhibitorum praecesserit.

" Cholera affectus est ferox, acer, acutissimus, qui vel uno die, vel altero, vel certe paucis diebus hominem rapit, substantia corporis effusa, partim assiduis vomitionibus, partim iisdem dejectionibus. Cholera interdum syncopen insignem, immodicamque virium resolutionem inducit, idcirco accurate internosci, et *celerrime* curari postulat. *Dilatio* enim omnibus morbis acutis nociva est. Et in Cholera exigua, ac levis curandi *mora* haud simplicem offensam, sed et absolutam tabem conciliat.

" Cholerae passiones aestate, atque autumno, magis fiunt. Pueris sunt familiares, senioribus rariores, et formidabiliores. In eo morbo vehemens sitis inutilis est. Optimus accedens somnus. Pars sanitatis est suppressum esse vomitum. Saepe etiam versa in vesicam materia, ardor inde urinae fuit. Summo in periculo res vertitur, si syncope comitatur, aut si quod evomitur male olet, ac stercoraceum est. Quod autem non olet, id tutum est. Plerumque post largiorem usum

melonum, cucumerum et aliorum id genus contingit, ut ventriculus graviter laborat, evomatque viscida et pituitosa, laborantisque facies mortuo sit similis. Caeterum nil Medicum terrere debet, quod nil inde periculi pendeat. Quibusdam diarrhoeae et cholerae, certis intervallis, omnem corporis redundantiam educunt. Et sunt quibus statis periodis ejusmodi cholerae salubriter moveantur. Sed vomitu et dejectione biliosa excernuntur nonunquam tanto impetu, ut inanito simul spiritu multo, vires languescant, et tremor cordis, ac syncope saepe succedant, et mors. Nulli enim morbo minori momento succurritur quam huic."*

Hoffmann gives us the following account of this disease.

" Valde conveniens cum dysenteria morbus est quam a copiosa biliosae saburrae per os, pariter ac anum facta excretione Graeci Choleram vocant, Caelius vero Aurelianus per fellifluam passionem interpretatur, et Willisius dysenteriam incruentam appellat. Ea autem est motus ventriculi ac intestinorum peristalticus, ab inherente varii generis materia acerrima, et caustica, ad convulsivam contractionem proritatus, ex parte praeter naturam inversus, et cum immoderatis biliosae saburae, tam per superiora quam inferiora rejectionibus conjunctus.

* Nicolai Pisonis de Cognoscendis et Curandis Morbis, Liber tertius, cap. 13, p. 70. Lugduni Batavorum, 1736.

"Cujus ante omnia differentiam a fluxu dysenterico notare convenit. Illa enim ad acutissimos referri meretur morbos, et intra paucos dies ad summum septimo finiri solet, cum dysenteria nisi fuerit summe maligna, diutius durare deprehendatur. Neque subinde dysenterico fluori semper conjunguntur vomitiones, nisi forsan in principio, aut vigente mali impetu, si accesserit ventriculi inflammatio, illae nonunquam occurrant. At Cholera nunquam sine vomitu est, sed nec tam molesto uti dysenteria tenesmo stipatur, nec tam frequentes cruoris dejectiones exhibet, nec denique contagium uti dysenteria spargit."

Subjecta Cholerae et Diarrhoeae Biliosae.— "Eadem fere utriusque morbi sunt subjecta, nimirum juniora, quae biliosa sicciori et cholerica gaudent constitutione siquidem succulentiora, phlegmatica et sanguinea alvi magis pituitoso laborare solent profluvio. Cum primis Cholerae observantur expositi, qui succos vitales acrimonia quadam scorbutica contaminatos possident, aut saburram acidam in primis fovent viis, ut fere sunt hypochondriaci, scorbutici et cachectici, indole simul iracunda praediti. Aestivo quoque et fervidiori existente tempestate morbus hic potissimum infestat, et quo calidiores sunt regiones eo frequentior et gravior occurrit; unde incolis Indiae, Mauritaniae, Arabiae, Americae endemius scribitur a Bontio et Thevenot."

Historia Morbi.—" Quod morbi historiam attinet scire refert, Choleram plerumque uno impetu invadere. Quamvis enim saepius ructus acidi, nidorosi, dolores ventriculi ac intestinorum pungentes, ac cardialgia et praecordiorum anxietates antecedant, tamen paulo post uno impetu et tempore sequuntur vomitiones aeque ac dejectiones. Et primum quidem ciborum ejiciuntur reliquiae, post humores biliosi, plus minus muco permixto, mox flavi, mox aeruginosi, mox nigri, plerumque acidissimi ac fere corrosivi, una cum copiosis ructibus et flatibus, necnon ipso nonunquam sanguine repetitis frequentissime vicibus redduntur. Praeterea acutissimi dolores, torsiones, rosiones, morsicationes, inflationes, ac borborygmi sentiuntur in intestinis, maxime supra umbilicum, et vehementissimae affligunt cardialgiae. Malo ingravescente, sitis accedit magna, extrema refrigescunt, cor palpitare incipit, septum transversum singultuosis agitatur convulsionibus, urinae fluxus cohibetur, corpus gelidis perfunditur sudoribus, et non raro graves animi defectiones saepius syncopticae, queis horrendae totius corporis conjunguntur convulsiones.

" Brevis quoque mali est exitus, interdum enim tertio vel quarto, vel quod rarius est septimo die solvitur, nec unquam diutius protrahitur nisi in alium transeat morbum."

Sectio anatomica cholera peremtorum.—" In

cholera peremtorum cadaveribus post mortem dissectis intestina praecipue gracilia, speciatim duodenum cum dextro ventriculi orificio *intus* gangraenata, extrinsecus bile suffusa ac flava, ductus vero biliferos nimium relaxatos invenire perhibent observationum medicorum scriptores, quos inter Dolaeum, et Bartholinum allegasse sufficiat. Praesertim Riolanus cystidem felleam *amplam* ductumque choledochum insigniter distentum adnotavit, et Acta Medica Berol. ejusmodi lethalem cholerae casum allegarunt ubi duodenum cum pyloro *interne gangraenatum* ac materia ex *fusco nigra* (qualis vomitu rejecta et examinata non nisi bilis sanguine permixta fuit) repletum, *vasa venosa ventriculi cruore turgida*, fellea cystis valde flaccida, et omentum versus ventriculum revolutum conspectui sese obtulerunt."

Sedes et causa materialis Cholerae.—" Quis inde non videt sedem cholerae, sicuti generatim in toto ventriculi ac intestinorum volumine, ita speciatim in duodeno, atque viis biliferis quaerendam esse ? Unde saepenumero universum nervorum genus in tristem malorum rapitur societatem. Neque enim ratio aliam determinare potest sedem si causam affectus nostri spectemus materialem. Nam vomitibus aeque ac alvo quae redditur materia, tantum non semper biliosa, licet non aeque sincera ubivis bilis existit, et modo humoribus acidis, pituitosis, salinis, aliisque peregrinis, necnon ipso cruore, permixta cernitur, unde etiam

varios colores, modo flavum, modo viridem, modo nigrum, et alios sortitur. Ejusmodi vero bilis commixtio non in alio loco quam intestino potissimum duodeno fieri potest, quippe quod partim ob sinuosum situm ac flexuras, partim affluentem ex ductu choledocho, bilem aeque ac pancreaticum succum producendae et fovendae saburrae istiusmodi accerrimae est oportunissimum."*

Sect. IX.—*Sydenham's Practice in Cholera.*—It would increase the size of this treatise too much were I to continue these quotations, or enter more fully into what preceding writers have left us on this disease. I shall therefore only add in this place what was Sydenham's practice in the epidemics which he has described, since, with little variation, it is that which has been continued to be used in Cholera till the occurrence of the Indian epidemic in 1817.†

" Sedula mentis applicatione, et multiplici etiam experimentia edoctus, quod si hinc *acres istos humores fomitem morbi*, catharticis expellere conarer, idem ageram atque is, qui ignem oleo extinguere satagit, cum cathartici vel lenis-

* Frederici Hoffmanni Med. Ration. tomi quarti, pars tertia, cap. viii. p. 487, et seq. Francofurti ad Maenum 1738.

† *Note.*—I regret that I have not had it in my power to consult the authorities mentioned by Mr. Scott in the Madras report, relative to the practice employed in India at different times, in milder visitations of the epidemic form of this disease prior to 1817.

simi operatio, omnia magis perturbaret, et novos insuper excitaret tumultus; et si ex adverso medicamentis narcoticis aliisque astringentibus in ipso statim limine primum humoris impetum compescerem, dum naturali evacuationi obsisterem, et invitum humorem detinerem, aeger inimico visceribus incluso, bello intestino indubie conficeretur. Has inquam ob causas, media mihi via insistendum esse duxi, ut partim scilicet humorem evacuarem, partim etiam diluerem; morbum itaque hac arte mihi a multis retro annis comperta ac comprobata, toties quoties in ordinem coegi.

" Pullus tenerior in tribus circiter aquae fontanae congiis elixatur, adeo ut carnis saporem vix perceptibilem liquor referat; hujus decocti (vel defectu ejus liquoris possetici) capaciores aliquot cyathos aeger tepide exhaurire jubetur, eodemque tempore bona ejusdem quantitas pluribus enematis successive injiciendis inservit, donec qua per superiora, qua per inferiora, tandem omne jusculum absumptum ac denuo rejectum fuerit. Hisce haustibus pariter ac clysteribus syruporum Lactucae, Violarum, Portulacae, Nympheae, eorumve alicujus, uncia subinde admisceri poterit; quanquam et citra ejusmodi additamenta, jusculum ipsum per se rem satis commode exequatur. Ita ventriculo insigni liquoris quantitate saepius onerato, atque ut sic dicam subverso, ac reiterata enematum injectione,

humores acres vel foras eliminantur, vel retusa acrimonia ad debitam temperiem revocantur. Exantlato hoc eluvionis penso, quod tres vel quatuor horas sibi vindicat, medicamentum aliquod Paregoricum curationi coronidem imponit. Mihi hoc crebro in usu est :

R. Aq. Paralys. ℥i.
Mirab. ʒij.
Laudani liquidi gtt xvi.

Cujus loco narcoticum quodvis officinale succenturiari poterit. Atque haec quam proposui diluendi humores via multo tutius ac expeditius, quam quae vel per evacuantia vel per astringentia vulgo instituitur periculosissimo affectui occurrit, quippe cum ab illis tumultus concitatior et ferocior evadat, ac omnia susque deque vertantur ; haec e contra hostem in medius visceribus detineant, ac ex advena reddant plane inquilinum ; ut taceam, protracto in longitudinem morbo, praeter periculum ex ejusmodi mora, qua in massam sanguinis tandem humores vitiosi irrepunt, atque *mali moris febrium* facile accendunt etiam aegris gravissimi mali taedium procreari. At vero diligenter est animadvertendum, quod si non accesserit Medicus nisi postquam aeger vomitu ac dejectionibus ad horas aliquam multas continuatis, puta decem, vel duodecim fuerit exhaustus, et jam frigescant extrema membrorum, hoc inquam casu, omissis aliis quibuscunque auxiliis recto cursu ad *sacram*

hujus morbi anchoram Laudanum intelligo, confugiendum est; quod non tantum exhibendum est urgentibus symptomatis, sed etiam cessantibus vomitu ac diarrhoea, mane, et sero quotidie repetendum, donec pristinas vires aeger, ac sanitatem tandem receperit."*

Sect. X.—*General ideas of the ancients on the nature and cause of Cholera.*—It appears, then, from the examination which I have made of the writings of the ancients, that they considered Cholera humida in general to arise from the presence of acrid humours in the alimentary canal, produced by excess in the use of various substances difficult of digestion, or such as created much irritation therein. Of these acrid humours, bile, in the limited sense in which we now use the word, seems to have been considered as the chief. They seem also to have been aware that symptoms similar to those of Idiopathic Cholera might be excited by the use of irritating medicines. Hoffmann mentions among the causes of Cholera, poisons, particularly arsenic and muriate of mercury, and acrid purgatives and emetics, also violent anger; and as predisposing causes, the prevalence of much heat in the atmosphere, or much cold applied to the body;

* Sydenhami Opera Med. tom. primus, sect. quarta, caput secundum, p. 106. Genevae, 1757.

and he concurs with Sydenham in considering frequent debauch by using strong liquors as an occasional cause of the disease in choleric subjects.

Sect. XI.—*Hoffmann's practice in Cholera.* —" Quo igitur citius, et in principio succurritur cholerae, eo felicior evadit curatio. Hanc vero aggressuro res potissimum occurrunt indicationes nimirum, ut antea omnia peccans et noxia materia corrigatur, attemperetur, ad exitum disponatur, et si opus fuerit arte proscribatur ; deinceps effraenus motus apte et convenienter sopiantur, et denique labefactatum nervosarum partium robur instauretur." In fulfilling these indications he recommends a practice not much differing from, though less simple than that of Sydenham. In speaking of the use of cold water he says, " Potus aquae frigidae in passione cholerica, quo calidior tempestas, regio, ipsaque aegrotantis constitutio fuerit, eo salubrior existet. Praeter ejus internum autem usum, gelidam quoque aquam extrinsecus ventriculo admovere velle, sicut a quibusdam veterum factum legimus, minus tutum, ac periculosum censemus, quod hac ratione, praematura vacuationum cohibitio induci." On blood-letting he has the following : " Sicut venae-sectio in dysentericis, sanguinis nimia simul mole laborantibus, ad praecavendam inflammationem, et mitiganda symptomata, egregium confert momentum, ita sub

iisdem circumstantiis eadem in cholera quoque administranda venit, praesertim *si virium sit integrum robur.*"* Nearly the same ideas, both as to the nature of the disease and its cure, have continued to influence the practice of physic till the present time.

CHAPTER II.

SECT. I.—*Nosological classification and division of Cholera Morbus by Sauvages.*—Sauvages has placed this disease under the second order of his ninth class, Fluxes, and mentions eleven varieties.

1. Trousse galant spontané, cholera spontanea of Hippocrates, epidemic cholera morbus of Sydenham 1669. In this variety he recommends Sydenham's practice as the best, but adds bleeding at the arm if the pulse is strong, and the pain considerable.

2. Trousse galant sec, cholera sicca of Hippocrates and Sydenham.

a. Trousse galant avec jaunisse produit par des champignons venimeux.

b. Trousse galant dyssenterique avec jaunisse.

* Hoffmanni opus supra citatum.

4. Trousse galant produit par des poisons mineraux, cholera a venenis fossilibus.

5. Cholera morbus praevenant d'un poison animal, des oeufs de brochet, des oeufs de barbeau ; du noir de séche. Plin. Hist. Natur.

6. Trousse galant intermittent, cholera intermittens Morton Pyretologiae, tertiana cholerica Forti.

7. Trousse galant Indien Dillon.

8. Cholera morbus inflammatoire, Cholera inflammatoria Amatus de Meyserey.

9. Trousse galant vermineux.

10. Trousse galant goutteux, Cholera ab arthritide repulsa, Sydenham est mort de cette maladie.

11. Trousse galant crapuleux de Meyserey.*

SECT. II.—*Classification, definition, division, and ideas on the disease by Dr. Cullen.*—Dr. Cullen has arranged this disease under his second class, Neuroses, Order third, Spasmi, and has defined it, " Humoris biliosi vomitus, ejusdem simul dejectio frequens, anxietas, surarum spasmata." He divides it into two species, the Idiopathic and Symptomatic. Of the former he gives two varieties, 1st, Cholera spontanea, and 2d, Cholera accidentalis. Cholera spontanea tempestate calida, sine causa manifesta aboriens. Cholera spon-

* Nosologie de Sauvages, tome troisieme, p. 114. Paris, 1771.

tanea Sauvagesii, sp. 1. Sydenham sect. 4, cap. 2. Cleghorn's Diseases of Minorca. Cholera Indica Sauvag. sp. 7.

Cholera accidentalis a rebus acribus ingestis. Cholera crapulosa Sauv. sp. 11, a venenis fossilibus Sauv. sp. 4, a veneno animali, Sauv. sp. 5.

Symptomaticae.

Cholera intermittens Sauv. sp. 6, inflammatoria Sauv. sp. 8, arthritica Sauv. sp. 10, verminosa Sauv. sp. 9.*

In the first lines of the Practice of Physic this learned Nosologist has given a good description of this disease as it appears in Britain, and in general in Europe. He describes it as most frequently occurring in warm weather, towards the end of summer, or during the autumn months, and its chief symptoms to be those which he has given in his definition, namely, a frequent, copious vomiting and purging of bile of a vitiated nature, accompanied with violent and very painful gripings, commonly with spasmodic contraction of the abdominal muscles, and very frequently of those of the extremities. The matter rejected both upwards and downwards (he observes) appears manifestly to consist chiefly of bile; from this last circumstance I conclude (he

* Culleni Synopsis Nosologiae Methodicae Mosquae, 1819, p. 131.

adds) that the disease depends upon an increased secretion of bile, and its copious effusion into the alimentary canal, and as in this it irritates and excites the motions above mentioned, I infer that the bile thus effused in larger quantity is at the same time also of a more acrid quality. This appears likewise from the violent and very painful gripings that attend the disease, and which we can impute only to the violent spasmodic contractions of the intestines that take place here. This and the following paragraphs of the tenth chapter, in which his description of the disease and his reasoning on its nature are given, though more copious, does not essentially differ from the description and opinions of Sydenham on the same subject, who however does not speak of morbid bile as a cause of the symptoms, but mentions " acres istos humores fomitem morbi."

CHAPTER III.

SECT. I.—*Author's ideas on the proximate cause of idiopathic Cholera.*—But both these eminent men "pace Magistri dixerim," and with much diffidence on my part be it written, have allowed their attention to be too strongly fixed on the leading symptoms of the disease, namely

the severe vomiting and purging of the acrid contents of the alimentary canal, and the consequent spasmodic symptoms attending these, while they seem not to have sufficiently investigated (at least if we may judge by their silence on the subject) the proximate cause of the disease ; for it cannot be doubted by those who will without prejudice calmly observe the rise and progress of Idiopathic Cholera, that though an unusual secretion of vitiated bile, or other humours, may, and very probably does, in general produce, or at least greatly increase the vomiting and purging, still, this does not explain the proximate cause of the diseased action of the liver, and other abdominal organs, on which the vitiated secretion depends, but makes us mistake an *effect* for a *cause*, while it directs our practice to the palliation of violent symptoms, withdraws our attention from their proximate cause, and prevents us from striking at the root of the disease.

In whatever manner we explain the action of the exciting causes of Cholera on the nervous, and sanguiferous systems, all the phenomena of the disease, as well as the morbid appearances on dissection, seem to shew, that the equilibrium of the circulation is greatly deranged, the capillary vessels on the surface either in a state of spasm or collapse, and the mass of blood accumulated in the larger internal veins, particularly of the abdomen.

In the essential character of this disease there seems to be but little difference between the description of the London epidemic of 1669 by Sydenham, and the Indian epidemic of 1817 and 1818 by Dr. Anderson* and others. I consider the presence or absence of bile in the alvine excretions not to constitute a difference in the disease, though it does so in the state of the patient, and is a good, perhaps the best index of its progress; the presence of bile even in considerable quantity is to be considered as curative, since it is probable that this bilious flux, when present, is an effort of nature to relieve the oppression of the internal circulation, the principal cause of the morbid phenomena.

Sect. II.—*Dr. Ayre's Pathology of Cholera Morbus.*—Dr. Joseph Ayre, in his excellent work entitled Practical Observations on those Disorders of the Liver and Digestive Organs which produce the complaints denominated bilious, second edition 1821, has the following paragraphs, "In the course of this disorder it sometimes happens, that a bilious diarrhoea takes place, which becomes critical, and carries off the complaint, the renewal of the secretion of the bile being in fact its natural remedy. And hence it frequently occurs, especially at the autumnal period of the year, that this disorder is relieved, a few hours

* Edinburgh Med. and Surg. Journal, vol. xv. p. 354.

after its attack, by a sudden reaction coming on, in the secretory vessels of the liver, by which a very copious and even morbid secretion of bile is produced, giving rise to sickness, and subsequently to a vomiting and purging of that fluid, constituting thus the proper *Cholera Morbus*, for this disorder termed the *Cholera Morbus*, as was stated in the introduction, is to be viewed as only one of the modes by which the *congestive state* of the *venous system* is relieved. From the violent and more palpable symptoms, however, which attend the copious secretion of bile, it has been common to view these as forming the whole complaint. The disorder, however, commences before the discharge of bile, and there may be therefore said to be two stages of it.

"In the first stage, there is present a congestive state of the liver, giving rise, when severe, to that condition of the system which we have already had occasion to notice, and which may be denominated the stage of oppression or collapse. When occurring in infancy and youth, especially in the former, it is not unfrequently fatal; and even in adults, it is often accompanied with fainting and other symptoms of an alarming character. In this stage there occurs an irregularity in the circulation, and an imperfect supply of blood to the extremities; the powers of the system appear *oppressed*, the extremities lose a portion of their heat, and often acquire a *livid*

colour; there is a general *restlessness* along with much *anxiety* and *oppression* about the *stomach,* attended with nausea and reaching, and severe spasmodic affections of the limbs, amounting in some cases almost to tetanus. In the infant there is frequently the fatal convulsion, which arises from the diminished energy of the brain, and which is indeed only a modified and higher degree of the general restlessness. In this stage there is in fact a manifest struggle between the oppressive influence of the complaint, and the vital energies of the system; the copious secretion of bile which is produced being the consequence of those energies acting to excess, to repel and remove it. In many cases in infants, and in some instances as well in adults as in children, from a want of energy, or from other causes, the natural efforts of the system do not remove the congestive state of the liver, and hence, in infants, are produced severe, and sometimes fatal, convulsions, and in adults residing in temperate climates, the common bilious fever; whilst in the peninsula of India, and generally in all the tropical countries, from the influence of heat, and other causes favouring the habitually large biliary secretion, the violence of the attack is sometimes so overwhelming, and the congestion of the portal circle so great, as to prevent even the febrile reaction, and a copious discharge of blood is poured out, chiefly perhaps from the

loaded vessels of the liver, constituting the fatal black vomit of that country.

"When that secretion of bile is induced which forms the second stage, it is usually in excess, and sometimes of an acrid and morbid nature, becoming, when very considerable, the source of other disorders. Of the two stages of this complaint, the first is that in which there is most danger, and in the treatment of which the most decisive measures are required. From the exhausting, and almost incessant nausea and retching which attend the severer form of this stage, with the coldness and lividness of the extremities, and the sunk and torpid countenance, and feeble, and often intermitting pulse, it is sometimes thought that wine and cordials are imperatively called for, and that they are all that can be in these cases trusted to. Such a view of the case, however, I can confidently affirm, is fraught with practical evil; for the wine and cordials thus employed, as I have too often had occasion to observe, only aggravate the cause of those symptoms which they are designed to relieve.

"In the first stage, the motions are always highly unnatural, and if there be a laxness, it is attended with much straining, and the discharge is watery and slimy, and sometimes of the colour of tar, or is chiefly composed of dark venous blood. The pain of the bowels in the severe forms of the disorder is sometimes excessive, and arises

probably in part from their partaking of the congestion of the liver, as well as from the irritating and acrid quality of the small portion of bile secreted, and from the distension produced by the fermenting state of the undigested matters passing through the bowels. In the second stage the motions are of a pale yellow, or yellowish green colour, and the pain in these cases arises from the irritation given to the bowels by the more stimulant quality of the bile, or from the natural mucous secretions of the bowels, which should have perhaps defended them, having been previously purged away. In the first stage, therefore, it is the secretion of the bile which requires to be renewed and rendered healthy; and it is only in the second, or that in which the secretion is excessive, and when, by the excess the powers of the system have become exhausted, that wine and cordials are admissible or necessary."

The above luminous exposition of the pathology of cholera by Dr. Ayre, I consider as the true one: it is that by which my practice in the epidemic form of the disease was chiefly regulated, and my experience has fully confirmed his general ideas of the disease.* Having lately

* I am happy in having this opportunity of publicly testifying the high sense I entertain of the merits of Dr. Ayre's work referred to above; we are not only indebted to him for a rational, and, as it appears to me, a true exposition of the pathology of idio-

received from England Dr. James Johnson's valuable work on the influence of tropical climates on European constitutions, I was gratified to find that he had founded his pathological doctrine of the epidemic cholera of India on similar views, and particularly on the connexion between a disordered state of the functions of the skin, and unnatural state of the circulation through the liver.

Sect. III.—*Morbid bile not the proximate cause of Idiopathic Cholera, according to Dr. Frank.*—It is proper, however, here to add, that the first rejection of the doctrine of super-abundant and vitiated bile, as the proximate cause of cholera, seems to be due to Dr. John Peter Frank, who, in his Epitome de Curandis Hominum Morbis, liber 5, pars 2d, editio prima Italica, p. 98, has the following passage: "Magna certe primam cholerae causam caligo involvit. In bilis per aestivos calores acredine adaucta, cholerae originem vix non omnes quaesiverunt, sed nequidem sub tanto morbi gastrici biliosi apparatu hoc malum ex bile,—sed bilem ex morbo scaturive contendimus, scilicet moestitia, quae salso genas humore incudat, ex lacrymis descenderet! aut maritimi navigatio, quae stomachum

pathic cholera, but also for one of the most useful practical works which, in our time, has issued from the press, on a most distressing, frequent, and dangerous class of diseases.

tibi movet, ac bilis flavae, herbaceae, aeruginosae copiam ex illo immensam pellit, biliosae foret indolis!....Quousque demum *effectus* morborum, pro *causis* venditare pergemus? Oleum ab igne rancescere dixerunt, quo quidem cocto, fricto, tot populi,—quin rancorem contraxerit, quotidie cum delectatione vescuntur; at bilem sub statu sanitatis vix per horas eandem, ac virium vitalium impedio gaudentem, a gradu caloris longe minori, aduri, torrefieri credemus! Secretionis ope morbosae, sicut alios humores animales, ita et bilem, tum copia, tum indole peccantem posse parari, lubenter concedimus; sed quod secretionis huic vitio ansam dedit, non humor secretus,—etsi hic quoque suos edere affectus queat, pro morbi causa ponendum est."

CHAPTER IV.

Sect. I.—*Probable predisposing and exciting causes of Diarrhoea, Inflammatory Dysentery, and Idiopathic Cholera.*—It may not be very easy to explain in a satisfactory manner how the abdominal congestion, which I believe to be the proximate or efficient cause of idiopathic cholera, is induced; it is, however, consonant to general experience, that congestive and in-

flammatory diseases of the chest are more frequent in cold climates, and during cold damp weather, than in warm climates, or in warm dry weather; whereas dysentery, cholera, and frequently bilious diarrhoea, prevail towards the end of summer and in autumn, while the two first at least rarely occur in the winter season. Why this should be the case it is difficult to decide; but, independent of occult atmospheric changes connected with the summer and autumnal seasons, in regard to these diseases, it is probable that in warm weather the cutaneous vessels, by long continued heat, are in a state of unusual action and excitement during the day, by which their natural sensibility is much increased; they are therefore particularly sensible to the great change of temperature, and the action of humid vapours collected on and near the surface of the earth on the setting of the sun, and during the night. Should these causes be applied for any time, or in a sufficient degree, the secretory action of the cutaneous capillaries may be checked, a contracted and spasmodic state of them induced, and an undue determination of blood to the internal organs, especially of the abdomen, take place, sufficient to produce congestion, and sometimes inflammation, which nature endeavours to relieve by the salutary process of an increased secretion from these organs—a natural effect of the undue accumulation of blood in their vessels. If the

determination of blood to the internal abdomen and the congestion be moderate, diarrhoea may be the consequence; if in a greater degree, and the congestion particularly take place in the liver, idiopathic cholera may follow; and if to the intestines, the ordinary inflammatory dysentery may supervene. Should a habitually difficult circulation exist through the vessels of the abdominal viscera from any cause, such as obstruction or other diseased organization; or should intemperance, the passions of the mind, or other causes affecting the balance of the circulation, or disturbing the natural action of the nervous system, be superadded, the disease will naturally be more easily excited, and its management thereby become more difficult.

Sect. II.—*Treatment of Idiopathic Cholera.*—In treating idiopathic cholera, it seldom happens that the practitioner is called to the patient till reaction has already taken place, and a copious discharge from the liver and other abdominal organs has been the consequence, the natural cure of the preceding congestion. Almost all therefore that remains to the practitioner to do in these circumstances, is to watch the progress of the disease, and to assist nature in her efforts by the use of diluents, (should much irritation seem to be induced by the unnatural quantity and quality of the secretions), and by a prudent

and well-timed use of opium, if danger is apprehended from the disposition to collapse, which is the consequence of the preceding symptoms. Should, however, the practitioner have seen the patient before the accession of vomiting and purging, and should there be reason, from the symptoms, to suspect the presence of abdominal congestion, bleeding, both general and local, leeching the epigastrium, the hypochondria, and the neighbourhood of the anus, the warm salt water, or the vapour bath, friction with stimulating embrocations, or the application of sinapisms, or a blister, and according to circumstances, alterative doses of calomel given at short intervals of time, or one or two larger doses, or calomel combined with rhubarb in the form of pills, perhaps with a small proportion of opium, are likely to prove the best remedies; our object being to diminish the irritation arising from the abdominal congestion by a prudent abstraction of blood, while by gently soliciting a discharge from the secreting organs of the abdomen, and a determination to the skin by the use of the warm bath, aided by calomel, we farther fulfil the same indication, and correct the vitiated state of the secretions.

ON THE PRESENT EPIDEMIC DISEASE,

KNOWN BY THE NAME OF

INDIAN OR EPIDEMIC CHOLERA.

PART II.

CHAPTER V.

PRELIMINARY OBSERVATIONS.

Cholera is, comparatively speaking, so rare a disease, I believe I may say in Europe in general, at least certainly in this part of it, that medical practitioners have seldom an opportunity of observing it. Hippocrates gives but three or four cases of it, and the venerable Heberden has not included it in the table of contents of his Commentaries. During upwards of thirty-six years' study and practice of physic, till the late epidemic of this place, I had only met with three well marked cases of it, one a case of severe idiopathic cholera in one of the nurses of the Royal Infirmary of Edinburgh, and the other two in

Moscow, one of which was but slight, but the other a dangerous case of cholera accidentalis, apparently excited by eating green peas which had not been sufficiently boiled. Since the occurrence of the late epidemic, I have been forcibly struck with the resemblance which this last case had with this disease. In it no bile appeared in the evacuations, which at the time seemed to me very much to resemble soap-suds. In these three cases irritation in the alimentary canal seemed to be the principal symptom requiring immediate attention; they all got well by using Sydenham's sacram anchoram opium. In the Edinburgh case, the patient an uncommonly strong muscular woman, the quantity of morbid bile thrown out both ways, particularly by vomiting, was enormous, and the collapse of the system great; at one time she had no pulse at the wrist, but violent cramps of the hams, the surface cold, and covered with a clammy sweat; yet all these symptoms gradually gave way, chiefly by the invaluable anodyne powers of opium; nature seemed to have done her own work here as in the other two cases, and it only required the physician's interference to moderate the violence of her efforts, in order to restore things to their natural state, and to husband the patient's vital powers, in order to effect the cure. The lowering of these powers seemed to be the effect of great irritation in the alimentary canal, attended

with copious evacuations and *consequent exhaustion* of nervous energy ; but in the epidemic, during the first period of the disease at least, with but few exceptions, the irritation in the alimentary canal was by no means great, so that had it not been for the vomiting and purging, which by their frequency were troublesome and exhausting to the patient, that part of the body might not have claimed very particular attention, while it was impossible to overlook that appearance of general languor, and oppression of the internal parts, which more or less strongly appeared in every case, even from an early period of the attack. This appears to me to constitute the essential difference between the symptoms of the epidemic and Cholera arising from other causes. In other cases of Cholera, and particularly in Idiopathic Cholera, although symptoms of oppression of the internal parts may be, and probably are, present from an early period, still there is not that uniform failure of the power of the heart and arteries which is so characteristic of the epidemic disease. The collapse is secondary, not primary ; whereas in the epidemic, joined with great oppression of the vital powers, and especially of the circulation, there is a loss of vital energy, occasioned, as it seems to me probable, by the action of a strongly sedative power. The patient has more the appearance of suffering from the action of poison, than of labouring un-

der the effects of a serious disease. He seems to have suffered as much in a few hours as a patient labouring under fever, whose case has been neglected, and who is brought to an hospital at the end of the second week, or during the third of the disease: there is a considerable resemblance in the appearance of the two. Struck by the uniformity of the symptoms, and by their singular character, I naturally enough proposed to myself these questions: Is there any other disease known, and primarily affecting the vital organs, in which death takes place so soon, with symptoms so strongly marking collapse of the vital powers? Certainly there is not. Is there any state of the body then to which this disease can be compared? I have never met with any, excepting the example of fever mentioned above, which is more in appearance than in kind; or those who have been under water, or poisoned by the inhalation of the vapours of carbonic acid gas. In all these cases an unnatural state of the circulation is induced, by which the actions of the nervous and sanguiferous systems are much deranged, and death not unfrequently soon follows. If such then be the case, it is probable, that the epidemic is not an exception, but that it is the consequence of a poisonous agent, producing at first, and that often very suddenly, a strongly sedative effect on the blood and vital organs.

The ideas here thrown out, arose gradually in my mind by reflecting on the cases of the epidemic which I had an opportunity of seeing, and were strengthened and confirmed by my farther experience, and by the observations of others; I remarked that without communication similar notions had been adopted by others, however they might differ from me in the manner of accounting for the action of the primary cause, or the effects produced by it on the body.

I reasoned on the probable effects of the Indian practice, and was convinced that it was the best yet known, when modified to circumstances.

In the greatest number of cases which I had to treat, there was already so much mischief done by the disease, that most of those who were saved from the first period, had to go through as it were a second purgatory in the consequences, or second period, frequently not less severe and fatal, and certainly often more difficult of management, than the first.

By connecting the origin and progress of the disease with its apparent effects, and comparing these with its morbid anatomy, I conceive that I have formed a pretty distinct notion of it as a whole; nor do I think (with all due diffidence on my part be it said) that its pathology is so very obscure as some have thought, however hidden its cause may be. Future experience and calm

reasoning are no doubt necessary before the truth and value of any opinions or practice can be justly weighed, and to do so time must pass. In the mean while, influenced by a sincere wish to be useful to my fellow-creatures, I have thought it incumbent on me to communicate my ideas and experience respecting this singular disease, well knowing how many of my professional brethren will take an interest in what has been a countryman's experience of it under so northern a latitude.

CHAPTER VI.

SECT. I.—*Identity of the disease with the Indian Epidemic.*—The disease on which I am writing is undoubtedly the same which the practitioners of India have described under the names of Epidemic Cholera Morbus, Spasmodic Cholera, and Mort de Chien, it is the Cholera Indica and Trousse galant Indien of Delon, Species seven of Sauvage.*

* Delon, Voyages aux Indes Orientales. Amsterdam, 1689. Sauvage, in speaking of the iliac passion of India, Ferchand, Ileus Indicus, Mordexin Frideric Hoffmann, tome 6, p. 207. Mort-detchin, Memoires de la Chine, dit, " Cette espece, qui est frequente a Goa et dans la Chine, est accompagnée de signes d'une saburre

Sect. II.—*Beginning of the disease in Moscow.*—Although some of the medical men of this city are of opinion that cases of this epidemic had begun to appear as early as August, still no case of the disease, as far as I have been able to learn, came to the knowledge of the medical police, or was recognised as Cholera, till the evening of the 14th (26th) September, when Demetry Michaeleff, a doorkeeper, residing in the quarter of the city called the Sretinka, near an open canal, which was under repair, and being covered over this last autumn 1830, was attacked with it. The ground through which this canal runs is apparently for some depth a black loom, and though open for a considerable space in the neighbourhood of the doorkeeper's dwelling, has for many years past been a waste, on both sides of the canal, not unfrequently boggy, and a receptacle for the impurities of the neighbourhood. The water running through this canal empties itself into the river of Moscow at a distance of about nearly three versts from the doorkeeper's dwelling, and the ground rises gradually by a considerable acclivity from this water-course on either side of the canal, in nearly an easterly and westerly direction, till it is intersected by the Sretinka street on the east, and

crue, de vomissemens violens, de tranchées atroces, et d'un obscurcissement de la vue; D'autres contendent sous ce nom le Cholera Morbus." Nosologie de Sauvages, tome iii. p. 110. Paris 1771.

the Tverskaia on the west, both situated at a considerable elevation above the level of the canal, and in the most elevated ground in Moscow.

I have been thus particular in describing these localities, because here one of the first, if not the first case of the disease was met with, and because it was in the hospital attached to this quarter, of which I was inspector, that I had my principal experience of the disease.

Although I had an opportunity of seeing patients both in the low and high parts of this quarter, still I thought at first that the sick were chiefly met with in the lower parts, and that as the epidemic became more general, it gradually extended itself to the higher ground.

I have lately been informed, that soon after Michaeleff was taken ill, three or four persons were affected with the disease in a house on the other side of the Boulevard immediately opposite Michaeleff's dwelling.

After an interval of a few days the disease began to shew itself in different parts of the town, at a considerable distance from the doorkeeper's dwelling, and without there being any suspicion of communication between him and others affected by it. It now became more widely extended, and proceeding with rapid strides affected persons of all ages and constitutions, from five to above seventy, but more particularly the lower classes from fifteen to sixty.

SECT. III.—*First cases seen by the author.*—The first case of the disease which I had an opportunity of examining occurred on the 7th (25th) September 1830, in a woman of the lower class under the care of Drs. Taehnichen and Voskresensky: the former was kind enough to go with me to visit the patient. We found her in a large brick building, in the immediate neighbourhood of the rag fair of Moscow, in the quarter of the city, and immediately adjoining the ancient city wall. The house where she lived was a receptacle for the sellers of old clothes, &c., was very filthy, and ill ventilated. Two persons had already died of the disease in or from that house, and she was in a bad way when I saw her; she lay on her right side, and answered in a weak and husky voice to my questions; the temperature of her skin was much below the natural warmth, and the pulse hardly to be felt at the wrist; she had had slight cramps in the legs, and watery vomiting and purging had been present for several hours. I had not an opportunity of seeing the evacuations, but from what I saw and was told, had no doubt in my own mind that this was a case of genuine Indian epidemic Cholera.

The next case came more immediately under my own inspection and care. On returning home to the charitable institution of Count Sheremitieff, of which I am physician, between two

and three o'clock on the 29th September 1830, I was informed that a man lay in one of the wards of the hospital affected with symptoms of cholera. I immediately went to see the patient, and found him apparently in a worse state than the first I had seen. It was with difficulty I could make out what he said; his hands were livid and cold, and the pulse very weak and unsteady; respiration difficult: he had been affected with severe vomiting and purging on returning from his morning work of stone building about nine o'clock. He was a lean diminutive-looking man, apparently of a weakly constitution, aged fifty. The day before he had been in an adjoining market-place, where he eat nearly his hatful of apples, and it was believed had drank rather freely of some strong drink. On coming to his dwelling in the vaulted part of the hospital, under the level of the street, he drank a large quantity of water, slept, and making no complaint, went as usual to his work next morning; he was brought to the hospital about one o'clock. Unfortunately two of the surgeons had been detached on service to the interior, and the third happened to be absent at the time, so that assistance was not given to this patient till I saw him. I ordered a warm salt water bath to be got ready as quickly as possible, and in the mean time prescribed a stimulant spirituous embrocation to be rubbed on his body, ten grains of calomel mixed

with some thick mucilage of gum-arabic were given to him, and immediately after swallowing the medicine he took the following draught.

R. Tinct. Theb. Edin. gtt. xxv.
Spiritus Vini Gallici tenuis ℥ ij.
Aq. Cinnam. ℥ ss.
Sacchari albi gr. x.
Aquæ puræ calidæ ℥ ss. M.

The state of the patient altogether was so unfavourable, and the appearance of general torpor, oppression, and collapse so great, that I judged general bleeding to be a practice too hazardous to be used under these circumstances, till I had tried the effects of the salt water bath. Accordingly he was put into it soon after it was ordered, and after remaining in it for some minutes, I was happy to observe that the patient expressed himself much relieved, and that the pulse began to be more distinctly felt. I now thought that a vein might be opened with some probability of success, and taking a favourable opportunity, he was bled in the arm to about five ounces; more could not be procured, the blood flowed with difficulty, and the pulse, instead of rising, began to sink again into its former state. He now complained of fatigue and restlessness, and desired to be put into his bed, which was complied with, and the following composition applied to the epigastrium.

R. Acidi Nitrici ʒ i.
Aq. puræ ʒ ij. M.

I now left the patient to the care of the surgeon, who observing that the diluted nitric acid produced but little effect, substituted a mixture of powder of cantharides and nitric acid; the following infusion was prescribed.

R. Rad. Valer. Sylv. ʒ iij.
— Serpentaræ ʒ ij.
Florum Arnicæ ℥ iss.
Infunde Aquæ fervidæ q. s. ad Colaturæ ℨ vi adde
Camphoræ gr. vi.
Etheris Sulph. ϑ i.
Moschi Orientalis gr. iv. M.
Omni hora ℨ ss. capiat.

I again visited the patient about five o'clock in the evening, and finding him much as I had left him, directed half an ounce of double mercurial ointment to be rubbed into the belly and thighs, sinapisms to the feet, and a repetition of the dose of calomel. As the vomiting had ceased and there appeared to be little or no purging, he was directed to wash down the calomel with an ounce of cinnamon water, and half an ounce of warm mint tea without laudanum. A drachm of rhubarb and as much magnesia, with four additional grains of musk, and a scruple of extract of liquorice, were now added to the infusion, of which a table-spoonful was ordered to be given every hour. On visiting the patient again about eleven o'clock at night, I found no change for the bet-

ter; he died about twenty-four hours from the beginning of the disease. Attention being paid to ventilation and cleanliness, and communication as much as possible prevented from without, the invalids being kept within the precincts of the establishment, I am happy to say that no other case of the epidemic occurred, though among the aged and infirm there must necessarily have been many predisposed to it. Several of the servants of the hospital were affected with troublesome diarrhœa, and derangements of the alimentary canal in general appeared to me to be uncommonly frequent among them.

At a later period, indeed, in the beginning of June 1831, a young man living in one of the wings of the establishment died of the disease after a few hours illness. He seemed to be predisposed to the disease, having laboured under symptoms of bilious Cholera during the epidemic.

Sect. IV.—*Author becomes member of the medical council, and takes charge of an hospital for the treatment of the disease.* About this time I was invited to assist at the medical council formed by the General Governor Prince Galitzen, and became one of its members, and inspector of the temporary hospital of the quarter Stretinka, intended for the reception of the sick affected with the epidemic. This hospital was partly formed before I took charge, and was intended to receive fifty patients, who for greater

convenience as well as safety were distributed in three separate buildings, the first, an hospital, properly so called, the second intended for convalescents, and the third, a house of recovery or probation, where the patients were kept till they recovered sufficient strength to undertake their usual employments, and where they underwent such purification as was judged useful and prudent before returning to their families.

CHAPTER VII.

SECT. I.—*Division of the disease into periods or stages.*—In order to the better understanding the nature of the symptoms of this disease, I shall adopt the language of Drs. Armstrong and Ayre, and consider it as consisting of three periods or stages: The first characterised by symptoms of oppression of the system in general, with considerable prostration of vital energy, and especially by an enfeebled action of the heart and arteries, producing strong internal congestions; the second, or the period of reaction, consequent upon and arising out of the effects of the first; and the third that of colapse.

These three periods pass insensibly into one another, and are not all uniformly observed in every case. In many the first only is present, the second not being induced, or the first may pass

into the third without any appearance of an intermediate stage; not unfrequently, however, there is an evolution of a second stage, which either terminates in the recovery of the patient, while the original symptoms entirely disappear, and the complaint puts on a febrile or inflammatory form; or, the powers of the system being unequal to overcome the effects of the first stage, the second passes into the third, or a complete collapse of the vital powers takes place, ending inevitably in the death of the patient.

By keeping this division in view, we shall be able better to understand the disease and apply the remedies.

Sect. II.—*Rapid course and fatal tendency of the disease.*—In general, before the patients were brought to the hospital several hours had already elapsed, so that we seldom had an opportunity of witnessing the commencement of the disease. Even in those who were affected with it in the hospital, either from an unwillingness to acknowledge themselves ill, or to be placed among the sick, they endeavoured to keep their being so from the knowledge of the surgeons as long as possible.

Partly from delay occasioned by these and other circumstances, and partly by the deadly nature of the disease itself, and its rapid progress, many were brought to us already beyond the reach of medicine: out of a hundred and sixty-

five patients sent to the hospital affected with the epidemic, thirty died within the hour, thirty-seven within twenty-four hours, and two were found dead in the carriage.

Sect. III.—*General description of the symptoms; first period.*—The symptoms which were commonly observed on the sick being brought to the receiving room, were, in general, coldness of the surface, the skin looked either pale or livid, a contraction, or rather a diminution of the natural fulness of the body, resembling the beginning of the cold stage of fevers, but without shivering, or the cutis anserina; the countenance contracted, generally pale, sometimes partly livid, the eye languid and listless. When the patient could walk without assistance, which happened but seldom, he stooped, and his gait was unsteady; the pulse at the wrist either not to be felt, or small, frequent, and feeble, respiration less deranged than might have been expected from the state of the circulation, though in general it appeared to me to be shorter than natural; the tongue commonly moist, either paler than natural, or of a bluish colour, and covered with a thin coating of slimy white mucus, its natural temperature was always diminished. In two cases I measured the temperature, by placing the bulb of Reaumur's thermometer under the tongue for two minutes; the mercury in one

pointed at 20°, and in the other at 25°. In the first the patient had been without pulse at the wrist all the morning, in the second it was with difficulty felt, and the patient had been without pulse at the wrist the whole of the preceding day. The bulb of a very delicate thermometer being held under my tongue for the same space of time, the mercury stood at 30°. In a third case, where there was no pulse at the wrist, and where the action of the heart was perceived with difficulty, a practitioner tried bleeding, only about an ounce of thick blood was procured, of a dark red colour, which coagulated firmly in a quarter of an hour, and then gave out only two or three drops of serum, the temperature of the blood, when first drawn, was 22°, and under the tongue 20°.

When questioned, the patients answered with a feeble voice, often husky, and sometimes almost in a whisper, the head was generally clear, and, at this time at least, the memory distinct; the complaint generally began with some sensation of feebleness and languor, succeeded either by a sense of weight and uneasiness, sometimes of pain at the epigastrium, or uneasiness of the head, with vertigo; sometimes with ringing in the ears. These symptoms were soon followed by purging, nausea, and vomiting, and very frequently by cramps in the muscles moving the toes, feet, and legs; the purging and vomiting were some-

times preceded by unusual flatulence of the bowels, or the disease, in the form of diarrhœa, would hang about the patient for several days, without any other very marked symptom, and then, if not attended to, put on the usual form of the disease : sometimes the patient complained of pain in different parts of the belly and extremities.

Sect. IV.—*Progress of the symptoms.*—The contents of the stomach and bowels were first thrown off, and now and then the evacuations were tinged with a small proportion of greenish bile ; but generally they soon became nearly colourless, or resembled a decoction of rice or barley, occasionally containing a white flaky matter, or they looked like whey. The purging and vomiting recurred frequently, several times in the course of an hour, and seemed in general to be attended with but little effort or tenesmus : in some cases where more than an ordinary quantity of drink had lately been swallowed, I have seen it rejected from the stomach with force, as if from a spout, or as is usual in gastritis. It appeared to me as if the evacuations took place more from the feeling of distension than from pain, or other cause of irritation.

If these symptoms were not soon relieved, they commonly increased in violence ; the spasms sometimes affected the muscles of the arms, thighs, and abdomen, and hiccough came on, and

was very troublesome to the patient; thirst was frequently urgent, and the patient sometimes complained of a sense of internal heat; in general the skin was dry and cold, but partial clammy sweat would sometimes appear on the forehead and face, breast and fore-arms, when these parts felt cold as in the agonies of death. In the worst cases, the lips, hands, arms, feet, and legs, looked livid, and the skin of the toes and fingers shriveled and blanched, they looked more like the feet and hands of an ape, than those of a human being.

From an early period of the disease, there was a marked failure in the natural power of the circulation, and in almost all the more severe cases the pulse was not to be felt at the wrist; a sense of weight and oppression about the chest, with jactitation, were frequent symptoms, and sometimes a palpitation of the heart; the secretion of urine seemed to be suppressed, and there was little or none passed during the first period of the disease; and although bile was generally found in the gall-bladder of those whose bodies were opened, still it rarely appeared in the evacuations of the sick, or was met with in the alimentary canal after death. Indeed it was sufficiently evident that the system in the first period was not in a state to perform secretion. The evacuations from the alimentary canal, in the beginning of the disease, do not appear to me to be the product of

secretion; but of this we shall say something more hereafter.

When the disease terminated fatally in this its first period, the powers of nature sunk under the severity of the attack, the vomiting and purging became less frequent, or ceased, the cramps disappeared, the body was bathed in a clammy sweat, the respiration became more irregular, and death, sometimes with convulsions, closed the scene. In this form of the disease death took place at various intervals of time, seldom I think longer than ninety-six hours from the beginning of the disease, frequently much sooner. Sometimes the patient looked as if he had been struck with lightning, so overwhelming was the attack, and so rapid was the progress of the disease. In all these cases nature seemed to be so appalled, that she was totally unable to make any effort for her relief. Occasionally from an early period of the complaint, and frequently during its course, the sick were affected with pain in the spine of the back, either generally, or partially, which, as the sequel proved, was always one of the most dangerous symptoms of the disease.

Sect. V.—*Second period.*—When the patients survived the first period, some appearences of reaction might generally be observed, which, however, were frequently fallacious; for although the pulse appeared to improve, and the

heat to return to the surface, the patients often died, either with symptoms of oppressed brain, or of congestion, and a sub-inflammatory state of some other internal organ.

Sect. VI.—*Second period assumes different forms.*—In the cases which passed through the second stage, and ended either in the recovery or death of the patient, by the intermedium of a febrile or sub-inflammatory complaint, I have observed four distinctly marked forms; the first characterised by symptoms of inflammation or sub-inflammation in the intestines, and perhaps in the stomach; the second, inflammatory irritation in the lungs, apparently by metastasis, and becoming as it were critical of the disease, with pain of the chest, fever, cough, and glutinous expectoration; the third, synochus biliosus, or bilio-nervosus, with inflammation and abscess in the parotid glands, in one case with axillary suppurating bubo, and towards the end of the fever inflammatory irritation of the lungs, ending in vomica; and fourth, a congestive sub-inflammatory state of the brain and spinal chord.

In the first three forms, there was nothing very remarkable in the symptoms; in some cases of the first and third, cutaneous eruptions resembling rubeola, but with a larger spot, and urticaria, appeared, and seemed to be connected with biliary irritation. Whether the symptoms of in-

testinal inflammation, in some of the cases of the first form, were produced by biliary irritation, or originated in previous congestion, is not easy to decide. All the cases with cutaneous eruptions recovered.

Some patients passed lumbrici both by mouth and stool. The fourth form was marked by general or partial pain in the course of the spine, without at first any very marked symptoms of disorder in the functions of the brain, the patients retaining their intellectual faculties; gradually, however, somnolency supervened, or the vessels of the lower part of the conjunctiva were observed to be unusually full of blood, while those of the upper part were in their usual condition. As this state continued, the patient lay with his eyes half shut, the somnolency increased, and he seldom awoke; if, however, he was roused, he answered questions distinctly enough. The axes of the eyeballs were now turned from their natural direction, and the eyes turned upwards, so as nearly to conceal the cornea; if the upper eyelid was raised, the vessels of the superior conjunctiva were now observed to be turgid with blood, and in some cases a film seemed to be formed on the eyes. The state of somnolency passed into coma, and the patient sunk generally a few hours afterwards. This diseased condition of the nervous system was sometimes accompanied with delirium, but seldom. In general the intellectual faculties

seemed to be but little affected in this disease ; the patient spoke and answered questions distinctly, although in a feeble whispering voice, being without pulse at the wrist, and having perhaps the eyeballs gorged with blood, and a cold sweat bedewing the brow, the breast, and the fore-arms ; not only the voice is much weakened, but also sometimes the sight and hearing are affected, although I have seen no case where these existed to such a degree as to merit the name of palsy.

Sect. VII.—*Disposition to Gangrene in the Toes.*—In one case the toes appeared as if they had been frozen, and disposed to become gangrenous. The sequel showed that this appearance was produced by the stagnation of the circulation in these parts, and the loss of vital power, which was unable to return the blood from the toes to the heart. The livid appearance of those parts of the extremities most distant from the heart, frequently met with in this disease, seemed to be an approach to the same state. In the case above mentioned, the circulation was restored, and the organization of the parts preserved, by the moderate use of stimulants, applied both internally and externally. The patient recovered.

Sect. VIII.—*Vitiated Alvine Discharge.*—In every case which terminated favourably, the alvine discharge put on a very unnatural appear-

ance; and morbid bile, of a very dark colour, and various hue, was thrown off in considerable quantities, day after day, till the complete recovery of the patient, under the use of alterative doses of calomel and ipecacuanha, sometimes with a small proportion of opium, and alternated with purgatives.

Now and then the fæces contained a considerable quantity of dark-coloured venous blood, or this was passed by stool without the admixture of feculent matter; sometimes the stools consisted of a bloody watery matter, like water in which flesh had been macerated; and in one or two cases they resembled the stools in an ordinary case of dysentery, consisting of bloody mucus; at other times, a thick yellow or light brown yeasty-looking mucus, or a puriform fluid, was discharged; and sometimes the stools looked like earth.

In one case ophthalmia of the right eye took place, but was removed without much difficulty. This patient passed a considerable quantity of dark-coloured blood by stool, which probably came from the liver. She recovered; and a copious sweat was one of the favourable symptoms which I noted in this case.

CHAPTER VIII.

DIAGNOSIS.

The early prostration of the vital energy, the remarkable diminution in the power of the heart, as shown by the pulse, accompanied with or succeeded by watery purging and vomiting during the prevalence of the epidemic, are sufficient to distinguish the disease, and ascertain its character; and the diagnosis will be still more certain if cramps have already supervened. All cases attended with irritation of the abdominal organs should be carefully watched during the prevalence of the epidemic, since such are predisposing causes, and frequently are observed to pass into or terminate with the symptoms proper to the epidemic. Symptoms strongly resembling those of the epidemic are sometimes induced by acrid or undigested matters producing irritation in the alimentary canal. The history of such cases will assist us in the diagnosis; but should such occur during the prevalence of the epidemic, the probability will be, that the irritating matter has acted as an exciting cause, whereas the efficient one has been a miasm.

CHAPTER IX.

PROGNOSIS.

The prognosis of this disease should always be very guarded, for it not unfrequently happens that patients, to all appearance doing well, are, without any very evident reason, suddenly affected with a return of the symptoms which mark the first period of the disease. This will be more likely to happen if any error in diet be committed by those who have just escaped from the danger of the first symptoms, even if such error may appear to be of minor consequence. Indeed, those who have to do with the sick cannot be too cautious in respect both to the quality and quantity of their food, of which I shall treat more fully afterwards. Where no error in diet has appeared to have existed, I suspected that some latent congestion about the brain or spinal cord was the probable cause of the return of the symptoms. In one case, which proved fatal, the change for the worse in the patient's complaint seemed to have been induced by his having caught cold, by his bed being placed near two windows, which, from the hospital being full at the time, there was no means of preventing.

Favourable symptoms are,—the pulse not dis-

appearing at the extremities, or, if it has left them, its reappearance accompanied with but little change of the natural heat; purging and vomiting not being too frequent, and still better when bile* appears in the stools; the cramps in the extremities either being absent or trifling. It is true, that, in the very worst and most quickly fatal cases, the spasms in the muscles are not observed; but severe spasms must, notwithstanding, be considered as an unfavourable symptom, since they indicate an unnatural and dangerous state of the nervous and muscular systems.

The patient is likely to recover, if, immediately on the first attack, he can be made to sweat profusely, while the natural heat of the surface is maintained. Hiccough, though a troublesome symptom, is not so dangerous a one as might at first sight be supposed.

Although there are, in general, no very strongly marked critical efforts of nature in this disease, with the exception of the primary purging and vomiting, still, when reaction has been established, I have sometimes observed the following:— Violent bilious diarrhœa, cutaneous eruptions, hæmorrhage per anum, and the final resolution of a protracted case, under a free continuance of the catamænia for ten days. In another case,

* I met with a few cases where the disease seemed to change its character, and assume the form of bilious cholera; towards the end the stools again became watery.

where abortion took place under an attack of bilio-nervous fever, the free discharge of the lochiæ seemed to contribute considerably to remove delirium, and to the favourable termination of the disease. This patient was also affected with cutaneous eruption in the form of urticaria. I met with no case where other hæmorrhages, usually considered critical, took place.

The most useful discharges are, in the beginning of the disease, free perspiration, when that can be produced, and in the second period bilious diarrhœa, excited by the efforts of nature, moderated by art, and the free discharge of the vitiated secretions of the abdominal organs by their combined efforts. Finally, suppuration in the parotid and axillary glands, diaphoresis, and metastasis of the disease to the lungs, with expectoration. In the urine, though frequently bilious-looking in the second period, there appears to be no critical deposition, and diaphoresis seldom takes place.

Unfavourable symptoms,—the pulse disappearing at the extremities, long continued and exhausting vomiting and purging, livid, shrivelled, or blanched extremities, much oppression about the epigastrium and chest, jactitation, severe spasms, and above all pain in some part, or along the whole tract of the vertebral column, with congestion of the vessels of the conjunctiva; the purging and vomiting ceasing, or nearly so, while the state of the patient in other respects does not

improve, shewing that the third period has already supervened, is to be reckoned among the most unfavourable symptoms.

CHAPTER X.

ON THE CAUSE AND NATURE OF THE DISEASE.

SECT. I.—*Progress of the disease in Russia, by the Volga.*—There can be no doubt that this epidemic is the same disease which, beginning on the banks of the Ganges in 1817, has gradually got as far north as Petersburgh; it appeared at Astrachan in 1823, and about the 9th of September, old style, 1829, at Orenburgh; it prevailed in Persia in the summer months of 1830, and soon thereafter appeared in the provinces of Bacu and Shirvan, afterwards at Elizabeth-Pole and Tiflis; it shewed itself a second time at Astrachan in the beginning of July 1830, and appears to have extended itself by the Volga, from thence to Tzaritzin, Saratoff, Kfalinsk, Penza, Samara in the government of Simbirsk, Nijney Novogorod, and then appeared at Moscow, leaving many intermediate places untouched; since then it has prevailed at many other places, and has stretched as far north as Vologda, Riga, and Petersburgh.

Sect. II.—*Difficulty of deciding on the mode of its propagation.*—As much obscurity has existed in Russia as in India with respect to the mode by which the disease is propagated from one place to another.

According to the account of Surgeon Salomoni, it appeared on the $\frac{3}{15}$ July 1830, in a vessel of war which had sailed from Bacu, where the disease then prevailed, and lay to, about ninety versts from Astrachan. Up to the $\frac{20}{1}$ July there was no appearance of the disease at Astrachan, it was confined to the quarantine of Sedlistsoff, where the vessel with the sick had been brought; but on that unfortunate day, four men were taken ill at Astrachan; and daily affecting a greater number of people, the disease extended itself, nobody knows how, through the whole city, and on the 27th it passed the boundaries, and affecting at first the villages in the neighbourhood, gradually extended itself through nearly the whole of the government.

Sect. III.—*Its epidemic nature.*—By an epidemic disease I understand such as either existing sporadically in a place or not, becomes more or less general, affecting a considerable part of the population; that this was the case with the disease of which I am treating, wherever it appeared, there can be no doubt: we may therefore safely consider it as an epidemic. Me-

dical authorities have commonly considered epidemic diseases as depending on, or at least influenced by, some particular state of the atmosphere, although they have not been able to shew in what that state actually consists; for although we cannot deny the influence of the atmosphere on the human frame, not only in respect to its ordinary qualities of temperature, dryness, or moisture, but also its impregnation with various foreign matters, still we are ignorant why at one time epidemic catarrh, at another dysentery, measles, or scarlatina, are the prevailing complaints, supposing it granted that these diseases, if not dependent on changes in the atmosphere, are communicated through its medium.

SECT. IV.—*Supposed to be communicated by the boatmen on the Volga.*—The practitioners in India seem not to be agreed respecting the propagation of the present epidemic; the same has been more or less the case in Russia; through the course of the Volga, wherever the disease appeared, it seemed to begin with, or to be communicated by the men employed in navigating the barks on the river; at Kfalinsk, a town on the Volga, two men were employed in mowing grass* on a little island in the river,

* Mr. Scarle quotes the following from the Report of the Madras Medical Board, p. 197, communicated to the Board by Mr. Chapman.—" A very curious circumstance, as connected with the

when one of them was seized with the disease; on examination it was found that they had been in company with the people who navigate the barks; the disease then spread through the town.

At Saratoff, the first man affected was one of these people who was found lying ill with the complaint on the banks of the Volga; the police officer who examined him was soon thereafter himself affected. Drs. Kildonchefsky and Zabiakin, who were sent to Saratoff and Kfalinsk, agree in believing, that the disease was commu-

probable remote cause of the epidemic cholera, occurred while we remained at Cape Comorin. Although little cholera was at this time prevailing among any other class of people, it became remarkable, that the *grass-cutters* of the escort were frequently attacked, and that usually in the evening, after having gone to a tank to cleanse their grass. On one occason two grass-cutters had been together at this tank at the same time, they were both attacked on the same night, at the same hour, and died on the following morning. Out of eighteen grass-cutters we lost five, besides others being affected, in the space of three weeks; it was presumed that the circumstance was in some measure connected with the putridity of the water contained in the tank, and which certainly bore every appearance favourable to such an idea, being scarcely passable from the nauseous effluvium which it evolved. The impression made upon the minds of these individuals themselves was corroborative of this opinion; the tank was spontaneously deserted by them, and no case of cholera occurred during a subsequent period of nearly nine weeks' stay at the same place."—*Cholera, its nature, cause, and treatment, &c., by Charles Scarle, Surgeon.* Pp. 53. 1830.

I have made particular inquiry at Dr. Zabiakin, from whom I had the account of the grass-cutters on the island in the Volga, as to the existence of any putrid water at the place, and am assured that nothing of the kind existed there.

nicated to the inhabitants of these towns by the people who navigate the barks on the Volga. I have had an opportunity of questioning a person who was at Nijney Novogorod when the disease first appeared there; according to his account, the first cases took place in the persons of two boys who were employed in sorting some unshorn sheep skins which had been brought by a bark from Astrachan; two of the people who navigated the bark died of the disease in the government of Kasan, on the passage to Nijney; both the boys died, and the day after a woman in the same house also died of this disease; the rest of the family now became alarmed, and informed the police, in consequence of which, the person from whom I had these particulars, became acquainted with them, through his connexion with the police.

SECT. V.— *Conjecture on the communication of the disease to the inhabitants of Moscow.*— Hitherto all inquiry regarding the manner by which Moscow was affected has proved fruitless, but giving all the circumstances their due weight, I incline to the opinion that the disease was imported to Moscow by persons coming from Nijney or Saratoff, as these were the only two points from which at the time there was any probability of the disease having been communicated: I am disposed to form this opinion from

the experience which I have had of the disease at Moscow, which has led me to the conclusion, that the disease may be communicated, under certain circumstances, from one person to another. In the hospital for the treatment of the disease under my immediate charge, of fifty-one persons much employed about the sick, eighteen were severely affected by it in about six weeks time, while in the houses in the neighbourhood not above three persons had the disease; of these eighteen three were medical men, the remainder were attendants on the sick, and employed in and about the hospital in different capacities; of eighteen soldiers thus employed, and in consequence in continual communication with the sick, seven were attacked and four died; but of six soldiers employed in transporting the sick, and therefore frequently in contact with them, but being much in the open air, none were affected; of twelve female attendants on the sick, and three washerwomen, six nurses, and one washerwoman were affected; she and one of the nurses died, while one of the nurses who was the most useful about the sick, employed during the whole time the hospital was open, and constantly exposed to the action of the effluvia, remained well all the time. As many who are exposed to the emanations from the sick escape the disease, and others under nearly the same circumstances are affected with it, we can only account

for this difference by resorting to the explanation which is given of this fact in regard to other diseases believed to be contagious or infectious, namely, the existence of predisposition in the habit of the individual so affected; of this we shall speak more at large, when we come to consider the predisposing and existing causes of the disease.

Sect. VI.—*No evident local cause.*—The absence of all evident or probable local cause, favours the idea of the disease having been imported into Moscow; for although the end of the preceding summer was unusually dry, and the common vegetable productions a very bad crop, the cabbage, &c., having suffered much from insects, still this seems insufficient to account for the origin of a disease, of the former occurrence of which I have found no record.

Sect. VII.—*Disease may be communicated by the sick, and epidemic constitution of the atmosphere sufficiently evident.*—At the same time that I admit the communication of the disease from one person to another, under particular circumstances, as in the wards of an hospital, or in a small ill ventilated room, and *a fortiori*, if other depressing causes are at the same time in action, and while I think it probable that it was imported to Moscow either from Nijney Novo-

gorod, or Saratoff, still it must be granted, that the agency of an epidemic constitution of the atmosphere* was sufficiently marked, while the communication of the disease from one person to another, excepting in situations as above mentioned, was much less evident.

Sect. VIII.—*Communication of the disease by inanimate objects not proven.*—Whether or not the disease may be communicated by inanimate objects, can only be decidedly determined by time and future experience. I have met with no case where there was reason to suspect the communication of the disease in this way, excepting in the above mentioned case of one of the

* The following article appeared in the Journal de St. Petersbourg Politique et Litteraire, No. 112, dated $\frac{1}{2}\frac{7}{9}$ September 1831:—"*Londres, 9 Septembre.*—Il vient de paroitre a Londres un traité sur le Cholera du Dr. Ch. Scarle, qui se basant sur son experience de plusieurs mois faite a Varsovie, soutient, que la maladie n'est pas contagieuse. Un fait interessant par rapport a la nature de la maladie est celui, qu'un navire Anglais parti de Londres pour Riga, il y a quelques semaines avec un equipage en parfaite santé, et qui sur la route n'a nulle part touché la terre, ni ancun autre batiment, a eté surpris dans la Baltique a la hauteur de Riga d'un calme, a la suite duquel le Cholera a eclaté parmi l'equipage."

The above is an interesting article, and should the fact be well established, it will go far in support of atmospheric influence as a cause of the disease.

I have since learnt from Dr. Marcus, secretary to the Medical Council of Moscow, that the above circumstances were confirmed to him by the Burgomaster of Riga.

washerwomen of the hospital, who, without having had any communication with the sick that was known, excepting in washing their linen, was affected with the disease, and died of it.

SECT. IX.—*Experiment might be made on criminals.*—It might be lawful to try, on criminals who had forfeited their life to the law, whether or not clothes used by the sick, and afterwards packed up, so as to exclude the free access of the air, may not have the power of communicating this disease. The question is one of great importance in a medical, political, and commercial point of view, and well merits this proof.

SECT. X.—*Lower classes particularly subject to the disease.*—Experience has sufficiently proved that the lower classes are particularly subject to the epidemic, and of them, especially the weak and broken down, or those who have been affected with previous disease.

SECT. XI.—*Predisposing and exciting causes, and subjects of the disease.*—Difficulties of the internal circulation, intoxication, and intemperance of all sorts, predispose to the disease, and prove exciting causes. Those who lived on the

ground floor,* or in cellars and vaults, and in filthy ill-ventilated houses, were particularly liable to be affected; and although no age, except infants, escaped, it was most common from puberty to sixty. Nurses and pregnant women were not excepted.

SECT. XII.—*Child at the breast not affected.*—I know of one instance where a child several times, during the night, sucked the breast of its nurse, who was found ill enough next morning with this disease to require being sent to an hospital. The child remained free from the disease. I have met with no case of the disease in a younger subject than five years.

SECT. XIII.—*Disease excited by slight causes.*—During the prevalence of the epidemic, it was observed, that slight causes, and such as at another time would have been but little attended to, such as food not easy of digestion, or the use of a rather large quantity of apples or other fruit, a dose of magnesia, or the exposure of the body to

* Dr. Livingston, in his observations on this disease as it appeared in China, observed, that those who slept in beds frequently escaped, while those who lay on the floor had the disease in its worst form, and he hence concludes that the morbiferous cause does not rise many inches from the ground, and is led to recommend sleeping on beds sufficiently high, along with other prophylactic means. Transactions of the Medical and Physical Society of Calcutta, vol. i. as quoted by Edinburgh Medical and Surgical Journal, 1826, vol. xxvi. p. 398.

sudden change of temperature, the passions of fear and anger, seemed to prove exciting causes of the disease.

Sect. XIV.—*Efficient cause, and intimate nature of the disease.*—In the investigation of the cause and nature of any disease, we naturally look to the symptoms and morbid changes which the disease may have produced in the body, for an explanation of the morbid phenomena. In this epidemic, the symptoms during the first period were so very uniform, that we may safely conclude that they must have been the effects of some uniform cause. The same may be said of several other diseases, such as smallpock, measles, scarlatina, lues venerea, &c., in producing which I believe that the profession are generally agreed, that a specific virus is necessary, although little more than this is known on the subject. As this epidemic is evidently a different disease from bilious cholera, or cholera morbus, the probability is, that it has its origin in some specific, yet undiscovered cause.

Sect. XV.—*Contrasted with Idiopathic Cholera, or Cholera Morbus.*—Idiopathic cholera, or cholera morbus, seems to be a disease connected particularly with the autumnal season, so much so, that Sydenham has considered it as being nearly limited to the month of August. "Cho-

lera morbus," he observes, " ex epidemicorum autumnalium familia, mense Augusto exorsus, intra angustos unius mensis cancellos conclusus percurrit sua tempora," and " intra Augusti limites se continens vix in priores Septembris hebdomadas evagatur,"* whereas this epidemic prevailed with but little, and certainly no essential difference under the burning climate of Hindostan, and the intense cold of Russia, unlimited to any period of the year. We may safely, then, I think, conclude, that the efficient cause of the disease, besides being uniform, is little, if at all dependent on, or affected by difference of temperature.

Sect. XVI.—*Disease more prevalent in towns than in the country.*—There is one remark which I think can hardly fail to have been generally made, namely, that the disease shews itself more particularly in towns and cities, than in villages, or the open country ; the reason of which is probably dependent on different causes, among which may be reckoned, that in towns, the mode of life, the local situation of the dwelling, permitting less free ventilation, the operation of a variety of sedative agents, besides the inferior degree of health enjoyed by the inhabi-

* Sydenhami Opera Medica. De Morbis Epidemicis. Genevae, 1757, tomus primus, p. 23, et processus integri in morbis omnibus curandis, p. 511.

tants of towns, compared with those of the country, may all have their share in favouring the action of a poisonous agent.

Sect. XVII.—*Epidemic does not arise from a local cause.*—While I admit all this, I cannot agree with those who are disposed to refer the disease to a local cause, however its evolution or propagation may be favoured by local circumstances; for what local cause could produce a disease which has gradually extended itself from the banks of the Ganges to those of the Neva, and of which, as far as I know, there is no record in the history of man?

Although it would appear, by the report of the Medical Board of Madras, drawn up by their secretary Mr. Scott, that epidemic cholera had formerly prevailed in India at different times, I have not yet been able to find among the ancient, or even among the more modern writers, any one who has left us a description of any such epidemic, which can at all be compared with the present in point of width of range, duration, and mortality. The description which Sydenham has given of the epidemics of 1669 and 1676 approach the nearest to it, though he does not mention particulars on these points.

Sect. XVIII.—*Disease probably arises from the action of a poisonous agent or miasm; its*

apparent physical properties.—To have produced it, some very widely extended cause must have been in action; what that cause may have been, or how produced, I know not; but judging by its effects, and the character of the disease, it seems to be a poisonous agent or miasm, possessed of considerable specific gravity, by which it is disposed to lodge more particularly in the lower strata of the atmosphere, perhaps proceeding from the bowels of the earth; hence one reason of its tendency to affect more especially those who live on rivers and canals, in low situations, cellars, ground floors, &c. Were the poison very generally and strongly diffused through the atmosphere, it would attack the population of a place much more generally than it does, as happens with epidemic catarrh, and would not be so much limited, as it commonly appears to be, to the lower classes, at least so was the case at Moscow. The modes of attack of the disease also, which we have already described, independent of predisposing and exciting causes, would seem to point out a difference in degree of severity, according as the quantum of the poison respired has been greater or less; for, on the one hand, it begins like a simple diarrhœa, without any very violent symptoms, while, on the other, the attack is so violent, as to put at defiance all the efforts of our art, and, as is well observed in Mr. Scarle's extracts from the Report of the Madras Medical

Board, the disease has more the appearance of "a general suspension of the natural, and gradual cessation of the vital, functions," (the usual consequences of poison) "than an establishment of morbid actions."

SECT. XIX.—*Similarity of the symptoms to those arising from the action of certain poisons.*—The similarity of the symptoms which arise from the exhibition of poisons, such as arsenic, muriate of mercury, &c., and the symptoms of cholera, has been noticed by several writers, among others by Frederick Hoffmann and Nicolas Piso. I was struck with the resemblance which the symptoms of the epidemic had with those produced by the inhalation of air strongly impregnated with carbonic acid gas, and have since read in Mr. Scarle's work that the same observation had been made by Mr. Chapman.*

We had a boy sent to the hospital by one of the young medical men at the police, supposed to be affected with the epidemic, who was next day quite well, having suffered from the vapour of a stove.

SECT. XX.—*Miasm seems to contaminate the blood by the organs of respiration; its effects on the economy.*—The morbid effects which succeed the inspiration of the miasm, seem to be the

* See Mr. Scarle's Work on Cholera, p. 56.

consequences of the poisoning of the blood, by which it becomes unfit for the purposes of the economy ; hence the languid action of the heart and arteries, the defect of circulation through the capillaries of the surface, the internal congestions, and the effusion of the serous part of the blood into the alimentary canal.

The marked change which takes place in the force of the circulation from a very early period of the attack, renders the idea of the contamination of the blood by the inspiration of a poisoned atmosphere very probable ; and the more the disease advances towards its fatal termination, the more strongly does this symptom appear. In consequence, the blood which should circulate on the surface hardly reaches it, and what does, is disposed to stagnate, as is evident from the frequently livid appearance of the extremities, while they lose their natural temperature, becoming cold, and often covered with a clammy sweat ; hence internal congestion follows, and by an effort of nature to relieve herself of a mass become oppressive, a drain takes place from the blood of its serous part in considerable quantity, which is thrown out of the body by purging and vomiting : the nervous and muscular systems are likewise considerably affected, and spasms of different muscles, and frequently hiccough, supervene, while the voice becomes weak, husky, and whispering, and the sight and hearing sometimes

partially injured. If the efforts of nature and of art to moderate the symptoms, to support the energy of the vital powers, and bring on reaction, fail, a total collapse now takes place, the first passing directly into the third period, without the intervention of the second; if, however, these efforts succeed, the second period, or that of reaction then begins, accompanied with more or less of fever, and under one or other of the four forms which I have described. These are probably in a great measure the consequence of the internal congestions produced in the first period, and generally assume a sub-inflammatory character.

Sect. XXI.—*Changes induced in the blood.*—That the blood undergoes considerable changes in this disease is sufficiently evident, both from its symptoms, and from the appearance of the blood when drawn, as well as in the dead body. It seems to be unduly carbonised, and to lose nearly altogether its arterial character. Blood drawn from a vein in this disease has not always the same appearance, but in general is of a very dark colour, coagulating quickly into a pretty firm, though easily lacerated crassamentum, with little serum. The natural temperature of the blood is considerably reduced. (See p. 58.) In the dead body, very dark-coloured blood, resembling the colour of the dark-

est cherry, is found very generally in the upper part of the aorta, and in other arteries. Whether these morbid changes are to be looked upon in part as causes or effects of the disease, it is not easy to decide : to me it appears probable that they are induced by the action of the primary cause of the disease on the blood itself, by which the natural changes produced in it by respiration are prevented, and thereby it becomes unfit for the purposes of the economy.

Dr. Taehnichen and Mr. Herrmann, chemist, of this town, think that direct decomposition of the blood takes place ; and the former, in Quelques Reflexions sur le Cholera Morbus, p. 62, Moscou, 1831, has the following :—

" Les idées que j'avais communiquées anterieurement au conseil de medecine sur l'epaississement du sang, sa tendance a la coagulation dans le corps encore vivant des malades affectés du cholera, idées que je croyais suffisantes pour rendre constamment compte de tous les symptomes qui caracterisent cette maladie, ces idées, dis-je, ont trouvé dans l'analyse chimique de M. Hermann un appui solide quoiqu'elles en aient necessité une modification. M. Herrmann a demontré,

" 1°. Le fait nouveau en physiologie de la presence d'une quantité notable d'acide acetique libre dans le sang, qu'il y considere comme le dissolvant de la fibrine.

" 2°. Il a demontré qu'il y avait une tres grande pénurie de serum et une partie proportionée d'-acide acetique dans le sang des malades affectés du cholera ; d'ou s'en suit la preponderance des parties plastiques du sang, ainsi que sa tendance naturelle a la coagulation.

" 3°. Il a demontré la presence de toutes les parties necessaires a l'integrité du sang, c'est a dire, celle du serum et de l'acide acetique, dans les matieres rejectées par les vomissemens et les selles.

" 4°. Enfin, il a demontré l'absence de l'urée dans le sang des choleriques, trouvée par Prévost et Dumas dans le sang normal.

" Je passe sous silence tous les details qui peurent prouver ces faits ; ils seront communiqués plus tard au public :* mais fort de leur appui, il ne peut point paroitre temeraire de poser en principe.

" Que la cause prochaine du cholera consiste dans une decomposition directe et particuliere du sang, dans une separation de ses parties solides de celles qui sont liquides, accompagnées d'une transudation des dernieres sur les surfaces intestinales."

* These details will be soon published in a communication from Mr. Herrmann, in the Bulletin de la Societé Imperiale des Naturalistes de Moscou, tome iii. 1831, p. 161, now in the press.

Sect. XXII.—*Determination of blood to the internal organs, and serous discharges, how induced.*—However the above may be, it seems highly probable that the vomiting and purging of the serous part of the blood are the effects of a strong determination of the vital fluid to the internal organs, and at first more particularly to the alimentary canal, from which the serous part (as is probably the case in some varieties of dropsy) runs off by the exhalants, by the *vis a tergo;* and it may be aided by a chemical decomposition, and by an inverted motion of the contents of the lymphatics, according to the ideas of Arctæus and Darwin.

Sect. XXIII.—*Serous discharges should not be suddenly or hastily checked.*—If this view of the disease be correct, it would point out the propriety of not hastily endeavouring to stop the serous evacuations from the alimentary canal in the beginning of the disease, but would rather indicate the endeavour to aid nature in another way, by drawing off from the mass of the circulation a portion of the blood, already become oppressive by its quantity being unduly determined to the internal parts, and thereby enable the moving powers to recover their natural force and elasticity.

Sect. XXIV.— *Ordinary diarrhœa most simple form of the disease; opinion on its cause and treatment.*—The most simple form of the disease is that in which it begins as an ordinary diarrhœa. Here, perhaps, the action of the poison on the blood may only have operated to that degree sufficient to produce turgidity of the abdominal vessels, which nature relieves by increased secretion of the organs of that part of the body. In this case little treatment is in general required. The case, however, should be narrowly watched, and managed on the principles to be more fully considered under the head of treatment, allowing the diarrhœa, if it be moderate, rather to exhaust itself, than trying to check it by opium. If, however, the case appears more serious, a full bleeding where circumstances permit, a strong determination to the skin by friction, and the warm bath, and moderate doses of calomel and opium, will be the best remedies.

Having already explained my ideas on the cause and nature of the disease, I do not think it necessary to enter into any detailed explanation of the symptoms; the reason of these must be sufficiently evident from what I have already said; I shall therefore only speak of those which seem to me to require some more particular notice in this place.

Sect. XXV.—*Explanation of some of the most remarkable symptoms.*—The disagreeable feeling so often complained of in the *first period* of the disease at the anterior lower part of the chest and epigastrium, is, in most cases, hardly to be denominated pain, but is rather an uneasy sense of weight and oppression or constriction of the parts; the patients did not seem to me to bear the pressure of the hand with difficulty, and in many the uneasiness was not at all increased by such pressure, though some did complain of its being thereby increased; at least, the uneasy feeling at this period was very different from the pain arising from acute inflammation. It probably is occasioned, partly by the morbid state of the circulation, and partly by spasmodic contraction of the parts, or of the stomach itself. The great contraction of this organ so often met with on dissection confirms this idea.

This disposition to spasm seems also to be communicated to the gall ducts, and is one principal cause why, during the first period of the disease, the bile, which may then be found in the liver or gall-bladder, so seldom passes into the intestines.

Sect. XXVI.—*Nature of the evacuations.*—The watery evacuations are chiefly composed of the serum of the blood, containing various matters, and their white appearance is produced by the admixture of the mucus of the alimentary canal.

The flakey matter sometimes observed is fibrine, according to Dr. Christie.

Sect. XXVII.—*Dr. Christie's opinion on the nature of the disease.*—This ingenious author has endeavoured to explain the phenomena of the disease by considering it as a catarrh of the mucous membranes, making a distinction between catarrh with, and without inflammation; but I conceive this is founding a distinction on difference in degree; in slight cases of catarrh, at first at least, no severe inflammation, properly so called, perhaps exists, the disease seeming to be produced by an unusual determination of blood to the parts affected, causing general turgidity rather than congestion and obstruction of the finer vessels; in all severe cases, however, these last are superadded, and give rise to the inflammatory symptoms which so often accompany the disease. We have examples of catarrhal affections of the mucous membrane of the alimentary canal, in the ordinary inflammatory dysentery, in that variety of diarrhœa which arises from the action of cold, or cold with moisture, on the surface of the body, and in some cases of measles; in all which increased secretion by the abdominal organs and from the surface of the alimentary canal takes place, but there is no such sudden prostration of vitality, no asphyxia in these cases; nor indeed does the supposition

of a catarrhal affection of the gastro-enteric or other mucous membranes seem to me to be at all adequate to account for the frequently very rapid progress of the disease, the changes in the blood, or the early enfeebled action of the heart, and sinking of the pulse.

That particularly at first, the onus of the disease seems to be borne by the gastro-enteric mucous surface is sufficiently probable, but it does not thence follow that the affection of this part of the body is the cause of the disease, however it may be of some of its symptoms; dissection has frequently shown that the cause of death was to be deduced with much greater probability from the effects of the unnatural state of the circulation through the vital than through the animal organs, and that the lesion of this part of the body was comparatively small. I am fully aware that the effects of a disease do not always appear on dissection, no more than its cause; but in this disease the unnatural state of the internal organs, connected with the previous history of the case, is generally quite satisfactory as to the cause of death. These morbid appearances are not uniformly found in any one organ; and although the alimentary canal frequently shows indisputable marks of its having suffered severely, still in other cases, were we to judge alone by what dissection reveals, the injury which it has sustained appears comparatively

slight, while the brain and spinal chord, the lungs or liver, perhaps the heart itself, show marks of strong congestion, or sub-inflammation. The probability then appears to be, that the morbid phenomena arise through the medium of a sedative impression principally made on some part of the system on which its vitality mainly depends, and none seems more likely than the vital fluid; for, notwithstanding the little value that has in Britain been attached for many years back to pathological opinions founded on the humoral pathology, still it cannot be denied that the solids may suffer through the medium of the blood.

Sect. XXVIII.—*Undue carbonisation of the blood a probable consequence of its contamination by the efficient cause.*—The present state of our knowledge does not admit of my saying more than has been already premised on the changes induced in the blood. I incline rather to believe that the want of the arterial character, and apparent undue carbonisation, are to be considered as effects induced by the sedative impression of the efficient poison; but whether the mode by which these changes are produced be chemical, or dynamical, or a combination of both, I have not yet been able to satisfy myself; the determination of such nice and difficult questions may become more easy, if by time and future in-

vestigation we shall be able to determine with more certainty than has yet been done, the intimate nature of the efficient cause.

Sect. XXIX.—*Blood does not always appear unusually dark-coloured in this disease ; inflammatory crust met with.*—That the disease may exist in a severe degree without the colour of the venous blood becoming much, if any thing, darker than ordinary, I have experienced, in the case of a strong young man who was bled at the arm about four hours after the first symptoms of the disease. On examining the blood about seven or eight hours afterwards, in two of the cups it showed a thin inflammatory crust, and the colour of the crassamentum was nearly natural. This is the only case in which I met with any appearance of inflammation in the blood in the first period ; the state of his pulse did not indicate such a tendency.

Sect. XXX.—*Unnatural alvine discharges during convalesence ; how induced.*—The vitiated state of the alvine discharge during the convalescence, may be the consequence of the prior congestive state of the internal circulation, and change in the qualities of the blood, and more particularly, perhaps, of a loaded state of the venous circulation through the liver, from which organ it is probable that the dark venous blood

passed by stool in some cases is discharged. Where a bloody mucus appears, it is probably derived from the mucous membrane of the intestines.

Sect. XXXI.—*The inflammatory, or sub-inflammatory symptoms not essential but consequent to the disease, its essential nature not inflammation but congestion.*—The inflammatory or sub-inflammatory symptoms which supervene when reaction takes place, are not essential to the disease, but appear to me to be the natural effect of the congestive tendency more or less present in every case. The essential character of the disease, therefore, is not inflammation, but congestion. This opinion is confirmed both by the symptoms and by the morbid appearances in the dead body, as well as by the qualities of the blood. This congestive state, however, is frequently followed by symptoms of a sub-inflammatory character, requiring active antiphlogistic treatment, which ought always to be kept in mind in the treatment of the second period of the disease.

CHAPTER XI.

MORBID APPEARANCES IN THE DEAD BODY.

SECT. I.—These were not uniformly the same, and varied, according to the duration of the disease, and other circumstances. The principal morbid changes observed in the bodies which have been opened in this city, were congestion of the blood-vessels of different organs, more frequently venous than arterial, at least the colour of the contained blood was much more frequently of a dark cherry, than bright red colour ; this observation applies more particularly to the mucous membrane of the alimentary canal, the liver and lungs, for as far as I have myself been able to observe, the state of the capillary vessels of the brain, spinal chord and nerves, was such as may be supposed to characterise a sub-inflammatory condition, the colour partaking more of arterial than venous congestion, but generally not so brightly red as is the case when acute inflammation has prevailed.

In one case, where the patient, I was told, had died with symptoms of typhus, the internal surface of the stomach appeared so black, that at first sight it might easily have been mistaken for gangrene. On examining the organ more narrowly, and exposing it between the light and the eye,

it was evident that neither gangrene, nor solution of continuity were present, but that the dark colour was produced by a remarkable degree of congestion of black-coloured blood, in the vessels of the part.

The stomach and intestines were frequently found considerably, though partially contracted, and the latter not unfrequently contained a white-coloured pulpy looking matter, more or less liquid, similar in appearance to the evacuations; no ulceration, or other evident consequences of inflammation were observed.

The liver in general partook of the venous congestion, but in no remarkable degree; the vena cava generally contained dark-coloured blood. The gall-bladder was frequently distended with dark yellow, or green bile; the gall-ducts sometimes contracted, at others not; the kidnies, spleen, and pancreas in general but little varying from their ordinary appearance; the urinary bladder commonly collapsed, and nearly empty; the uterus natural.

Marks of congestion and sub-inflammation sometimes appeared on the diaphragm; the lungs were very generally loaded with dark-coloured blood, the heart more or less filled with the same, and coagula of fibrine sometimes extending into the large blood-vessels, adhered to its internal surface; the vessels proper to the heart itself turgid with blood. In all the dissections I saw,

uncoagulated very dark-coloured blood was found in the arch of the aorta, and not unfrequently was met with in other arteries. Sub-inflammatory congestion was frequently observed in the brain, particularly towards its base, and in different parts of the spinal chord, and in the course of the larger nerves, serum was sometimes found in the ventricles of the brain, and now and then blood effused on the brain, cerebellum, and spinal chord, of which last partial softening was occasionally remarked.

Sect. II.—*Nature of the disease induced from the combined consideration of its symptoms and morbid anatomy.*—From these appearances, and the symptoms of the disease, I am disposed to conclude, that it essentially consists in a congestive state of the internal vessels, accompanied with spasmodic contraction of different parts, and disposing to a sub-inflammatory condition more or less marked, which shews itself in the different forms which I have described above.

CHAPTER XII.

PROPHYLAXIS.

Sect. I.—*Epidemic nature of the disease generally admitted.* The explanation of the cause

and propagation of epidemics has, and will probably always continue, to be a matter of difficulty and dispute; the reason of which is sufficiently obvious, since neither are in general cognisable by our senses. A wide field for conjecture is therefore opened. In regard to the disease of which we treat, its epidemic nature, I believe, is not disputed. During the prevalence of the disease few enjoyed perfect health, some complained of uneasiness in the head, others of cramps in the lower extremities, or of unusual flatulence. I had occasion to attend some affected with diarrhœa, others with bilious vomiting and purging, and some with symptoms indicating considerable derangement of the biliary secretion.

Sect. II. *Cause of the disease generally supposed to be a miasm.*—It seems to be pretty generally allowed that the cause is a noxious agent, whether under the name of miasm, mephitis, or malaria; whence it comes, or how it is produced, is not certainly known, nor can we give a more reasonable account of it than Lucretius has done of pestilential vapours in the following words:

" Atque ea vis omnis morborum pestilitasque
Aut extrinsecus, ut nubes nebulaeque superne
Per coelum veniunt, aut ipsa saepe coorta
De terra surgunt, ubi putrorem humida nacta 'st
Intempestivis Pluviisque et Solibus icta."
——" Proinde ubi se Coelum, quod nobis forte alienum 'st
Commovit, atque Aer inimicus serpere coepit:

Ut nebula ac nubes paullatim repit, et omne,
Qua graditur, conturbat, et immutare coactat,
Fit quoque, ut in nostrum cum venit denique coelum ;
Corrumpat, reddatque sui simile atque alienum.
Haec igitur subito clades nova, pestilitasque,
Aut in aquas cadit, aut fruges persidit in ipsas,
Aut alios hominum pastus, pecudumque cibatus:
Aut etiam suspensa manet vis Aere in ipso :
Et cum spiranteis mistas hinc ducimus auras,
Illa quoque in corpus pariter sorbere necesse 'st."

Nor are medical men agreed on the mode of communication of the disease, for here as on many other occasions it is a question if it is contagious or not.

Sect. III.—*Propagation and communication of the disease.*—To apply what I have been able to learn and observe on the above subjects, I would remark, that it is not at all probable that difference of opinion could have existed, had the matter in question been very clear, or without there having been considerable grounds for the opposite opinions ; as in most disputed subjects, the truth will probably be found to lie at the middle point.

It is a probable idea, that the disease arising from a noxious miasm whose origin is unknown to us, but which appears to possess considerable specific gravity, compared with atmospheric air, is either conveyed by the winds from place to place, or comes from the bowels of the earth

itself, and when accumulated in sufficient quantity under circumstances favourable to its action, gives rise to the disease.

That under ordinary circumstances, and tolerable attention to ventilation, it is seldom if ever communicated from one person to another, must be granted; but that where the contrary takes place, it may be so communicated, seems also true.

The progress of the disease from Bacu to Astrachan, and from thence by the navigation of the Volga against the current of the river, everywhere seeming to affect the people employed in navigating the barks, and then the inhabitants of the towns on its banks, where these barks lay to, without at first deviating much from the course of the river, seems to favour the opinion of the disease, in these instances at least, being communicated by the boatmen to the inhabitants; in these, however, as in other cases, when once the disease begins in a place, acting as it were like a ferment, the number affected quickly becomes so great, as to render it highly improbable that it is then only communicated from person to person; we are therefore reduced to the necessity of admitting some more general cause, namely an epidemic constitution of the air, which however does not, as we have already observed, seem to be very widely extended, but to be confined to

the lower strata of the atmosphere, and hence one reason why the lower classes are first and chiefly affected by it.

Sect. IV.—*Disease not strongly infectious.*—That the disease is not strongly infectious I conclude, from the number of medical men and attendants on the sick who escaped the disease, while, on the other hand, I must grant the probability of its being communicated by the respiration of air impregnated with the effluvia of the sick under circumstances favourable to the evolution of the disease, since the proportion of those affected under these circumstances was much greater than under any other.

Sect. V.—*Not communicated by simple contact, or by the dead body.*—I have met with no case where simple contact with the sick seemed to have communicated the disease, nor has it appeared that those employed about the dead, or in opening them, have suffered thereby.

Sect. VI.—*Means of preventing its propagation and communication considered; little if any utility from Quarantine. The disease does not seem to be communicated by inanimate objects.*—When so formidable and fatal a disease, as is this epidemic, is prevalent, it naturally becomes a question, what are the best means, if

there are any, of preventing its propagation? and when existing in a place, of destroying its disposition to infect those who are necessarily employed in the care of the sick, or those otherwise exposed to the influence of the cause of the disease? The resolution of the first question it is evident will greatly depend on its communication by the air being admitted or not; for if it be so communicated, quarantine regulations must be nearly nugatory, while, on the other hand, if the disease is communicable from one person to another, they might avail, provided they were strictly enforced; but this in inland situations is so very difficult, that they become a matter more of appearance than of real utility; in insular situations, the enforcing such regulations may be more practicable, and the inhabitants would no doubt submit with less reluctance to such necessary restraints, provided they were convinced of their necessity and utility, but till that appear more clearly, they will always be looked on as vexatious.

In Russia they appear to have had but little if any effect in preventing the progress of the disease. Its communication by the medium of inanimate objects, although supported by some in this country, has not been clearly proved; while the contrary opinion has been very general.

Sect. VII.—*On destroying the miasm, and*

noxious effluvia from the sick, with precautions on exposure to the action of these causes.—In regard to the destruction of the noxious effluvia from the sick, or of the miasm which we believe to produce the disease in places where it is supposed to exist, free ventilation must hold the first place. In the hospital under my charge, a solution of chloride of lime, or water impregnated with chlorine, was exposed in flat vessels in the different wards, and fumigation with the muriatic acid vapour was used occasionally in the convalescent division of the establishment, besides frequent purification of the air of the hospital with the vapour of vinegar and mint, and as much ventilation as circumstances permitted, were employed, all which did not prevent eighteen out of fifty-one persons much employed about the sick from being attacked; but it is worthy of remark, that excepting one, and the washer-woman mentioned p. 74-6, all these eighteen were affected, after being occupied with the sick in the first and second stages of the disease, in the hospital part of the establishment, while the attendants who were employed in the convalescent divisions all escaped, with the exception of the one above alluded to, who, after being employed for a few days in the hospital part, had been attached to the convalescent division a short time before the beginning of her disease, and was there taken ill.

Sect. VIII.—*Precautions used by the author himself, and his opinion why he escaped the disease.*—I made a practice of washing my hands with water impregnated with chlorine, or of slightly rubbing them with chloride of lime, and then dipped my finger in oil before examining the sick, which I did very freely and minutely on all occasions, only avoiding as much as I could the breathing the air in their immediate neighbourhood, or coming directly from their lungs, or swallowing my saliva while in the hospital; and though much about them daily for two months, escaped being affected. Others who took no precautions also escaped.

Although daily undergoing much fatigue and anxiety, I attribute my escape from the disease, principally (with the blessing of God) to regular living, firmness of mind, and the excitement naturally induced by the circumstances in which I was placed.

Sect. IX.—*Disease said to be communicated by the not-affected.*—Some have alleged that the disease may be communicated by a person, or by the clothes of one not affected. Thus the disease has been said to have been propagated by people coming from a place where it prevailed, while they themselves remained well, or, at least, were not affected for some time after they had

left the place, to which it was supposed they had brought the disease.

Sect. X.—*Cases of organic disease of abdominal organs terminating fatally with the symptoms of the epidemic.*—During the prevalence of the epidemic here, I was attending two cases of organic disease of the abdominal organs, in different houses, the one a chronic case, the other, after being chronic, had put on an acute form. Both died with the watery purging and vomiting, and other symptoms of the epidemic: no other member of either family was affected, and neither patient had left the house since the complaint appeared. *Quere*, How did these patients get the disease? was I or my clothes the medium of communication? or was the existing organic disease acting as a predisposing or exciting cause, under the then epidemic state of the atmosphere sufficient to produce the disease? I confess I see no means of answering these questions in a satisfactory manner. One of the patients lived in the neighbourhood of one of the police stations, and was thereby exposed to hear or see frequently the transport of the sick or dead; her mind was certainly unhinged by fear of the disease: the other was not so affected.

Sect. XI.—*On prophylactic diet.*—Much error appears to me to have prevailed here on the

subject of diet as connected with prophylactic precautions. The use of fruit was nearly proscribed, although I cannot see why in moderation it should not have been used, nor is there any good reason why people under such circumstances should live so abstemiously, as some seemed to think it necessary they should do. On the contrary, in a disease where all depressing causes so evidently favour the attack, next to the due regulation of the mind, the supporting the body by a sufficiency of good nourishing food, appears to be one of the surest means of prevention.

I believe much good to have been done by the charitable distributions of food, &c. to the lower classes, which was so properly had recourse to here and elsewhere during the epidemic, and that the mortality was considerably reduced by the removal of the sick and poor from their infected dwellings to the temporary hospitals and other charitable establishments. But while I recommend a sufficiency of plain wholesome food as a useful prophylactic, I must recall attention to what I have before said on errors in diet, both as exciting causes of the disease, and of relapse: excepting from such, or from getting cold, I have met with no other cause of relapse, and have seen no case of second attack.

CHAPTER XIII.

TREATMENT.

SECT. I.—*General remarks on.*—The treatment of the disease must vary according to the circumstances of each individual case; but our success will much depend not only on the remedies employed, but also on their timely employment. A *medicina expectans* is here quite out of place: the practitioner should never forget the words of Hoffmann, "Si in omnibus morbis certe in cholera nunquam locum habebit cura per expectationem;" and while he guards equally against remissness and rashness in his practice, he must try to seize the golden moments as they pass, endeavouring to fulfil the following indications, by employing his remedies in succession, in such a manner, that the last employed may confirm and further the effects of the one which preceded it, as is well observed by Dr. Armstrong, I believe, in his work on Typhus, a remark of which every practitioner must daily appreciate the value.

The importance of *early application* for medical assistance, in this disease particularly, can only be sufficiently appreciated by those who have had to do with it. It ought to be impressed by the authorities on the minds of a population

threatened with the epidemic, in the strongest manner.

Sect. II.—*Curative indications.*—With the ideas on the cause and nature of the disease which I have exposed above, the following curative indications naturally present themselves.

1st. To endeavour to produce a healthy change in the blood tainted by the cause of the disease.

2d. To obviate the sedative effects produced on the system by the operation of this cause, and moderate the watery purging and vomiting.

3d. To direct and moderate the reaction, so as to assist nature in restoring a healthy action, and balance between the different parts of the system; and,

4th. To restore tone and vigour to the system, so as to enable it best to resist the action of noxious agents, and more particularly to avoid a relapse, or secondary attack.

Sect. III.—*Removal from a place where the disease prevails to high ground and a purer air recommended.*—As I consider the symptoms to arise from the action of a poisonous agent operating directly on the blood through the vital process of respiration, so in fulfilling the first indication, the best and safest way of counteracting its agency will be, if possible, to remove from the place where it is found to prevail, to the

highest ground, and purest air we can find. The utility of doing so will be rendered more evident by remarking what took place here and elsewhere during the prevalence of the disease. The Marquis of Hastings only saved a part of his army in India by marching it from place to place; and the inhabitants of Tabris and Tiflis found their safety in betaking themselves to the mountains. The disease has been everywhere observed to prevail most in low and damp places. At Moscow the charitable institutions of Prince Galitzin and Count Sheremetieff, and the institution for the education of the young female nobility, all situated on high ground, nearly escaped the disease, while the Foundling Hospital, placed near the river, suffered severely.

Sect. IV.—*Utility of respiring an atmosphere containing a larger than usual proportion of oxygen, or protoxide of azote, suggested.*—Whether or not by the respiration of an atmosphere impregnated with a larger than usual proportion of oxygen gas, or by the respiration of the protoxyde of azote, we might not be able to produce a favourable change in blood already tainted by the action of the miasm, must be a subject of future inquiry. Towards the end of the epidemic I made some experiments with these gases; but from the difficulty of procuring a proper apparatus, and other circumstances,

they were not made to my satisfaction, so that I am not able to speak decidedly on the subject. Under their use the pulse was observed to rise, but when the patient ceased to respire the gas, it relapsed again into its former feeble state.

Sect. V.—*Circumstances must direct what means are to be first employed.*—The circumstances of the case must direct whether the removal of the patient ought to precede or follow general bleeding. The sooner, however, a patient is placed so as to breathe a pure and fresh air, the greater will be the chance of saving his life.

Sect. VI.—*General bleeding, when to be used, and how practised.*—When the primary symptoms only have shown themselves, such as uneasiness in the head, or at the pit of the stomach, or where the disease has assumed the form of an ordinary diarrhœa, it will be a prudent practice, especially in the young and plethoric, to take some blood from the arm; and as the object here in view is not the diminution of the tension of the system as in inflammation, but the subtraction of a part of the mass of blood already become oppressive, or soon likely to become so by its quantity and unnatural qualities, as also by its undue determination to the internal organs, so the doing so by a moderately sized opening in the vein will be the

safest practice ; it must not be too small, otherwise the difficulty of drawing blood, which is always experienced when the disease has made some progress, might thereby be increased, and frustrate our purpose.

As the blood loses a large portion of its serum by the evacuations, it becomes proportionally thicker, and more disposed to coagulate, and as its progress to the heart becomes also slower by the nature of the disease, so it is often no easy matter to draw off a sufficient quantity.

The proportion to be drawn must depend on the circumstances of the case, but unless it be sufficient to relieve the oppression of the circulation, and to enable the heart and arteries more easily to contract and propel their contents, it will be of little use ; on the contrary, a free bleeding has frequently been found of great service, and has sometimes cut short the disease ; to do this, however, it must be employed early, before great oppression of the vital powers has taken place, for after this, particularly if the pulse has ceased at the wrist, it is more likely to do harm than good. I met with no case where general bleeding employed in the first period of the disease was useful, unless where it was used early. The employment of blood-letting appears to me to require no small degree of judgment ; wherever it can prudently be employed in the beginning of the disease, it is likely to be of more use

than any thing else; but, on the other hand, if it does not serve to raise the vital energy, it may have a powerful effect in favouring the state of collapse, which is so apt to supervene in this disease; its effects at the time of the operation should be carefully watched, and if the pulse, instead of rising under its use, should sink, the opening ought to be instantly closed. I can see no advantage in bleeding *ad animi deliquium* in the first period of this disease, as some advise, where there is neither general tension nor inflammation present, but simply a loaded and congestive state of the internal circulation; on the contrary, I think it ought to be our aim not to induce syncope by the detraction of blood, and for that reason the patient should be bled in the horizontal posture with his head but little raised, and, as we have elsewhere observed, the opening of the vein should be moderate, so we shall with the greater certainty succeed in drawing off what quantity of blood may be deemed necessary for relieving the oppression and torpor of the circulation, with the smallest probability of inducing consequent debility by the loss of blood in a disease where fatal collapse is so apt to take place.*

* Bleeding in cholera is not a new practice; it is recommended in certain circumstances by Frederick Hoffman and Sauvages, as I have mentioned, pp. 27, 28; and is treated of, though not approved, by John Peter Frank.

Sect. VII.—*Use of different baths.* No time should now be lost in getting the patient into a hot bath of salted water, the heat of which should be gradually raised from about 30° to 35° of Reaumur, or the patient may be first put into the bath and then bled in it. Where the circulation on the surface has become languid, and the temperature diminished, immediate means should be employed to restore them, by promoting the flow of blood through the capillaries of the surface, by stimulating frictions, the warm bath of salt water, or water with a proportion of ammonia; the vapour bath, by means of the vapour of water passing through stimulating aromatic herbs, or the vapour of vinegar or spirits. Perhaps a warm air bath, as wanting moisture, which disposes to relaxation of the surface, and is not desirable in the first period of the disease, (unless under the circumstances mentioned below,) might be preferable. It is sometimes advisable to bleed the patient in the bath, as by so doing the action of the vital organs is more quickly excited, and the internal oppression relieved.

Repeated observation by different practitioners has proved the utility of sweating, especially in the beginning of the disease, whenever we are able to excite it, which, when the disease has made some progress, is done with difficulty; for this purpose the warm bath, or warm salt water

bath, or vapour bath, is certainly one of the best means, as it is one of the first remedies to be used; the public should be generally instructed, that till the arrival of the practitioner, the patient would do well to use this remedy, the timely use of which may save life, and render farther treatment less necessary, or more successful.

Should a bath not be immediately at hand, copious sweating may frequently be induced, by putting the legs up to the knees into a tub nearly filled with hot water strongly salted with common salt, to which may be added two common teacupfuls of powdered mustard seed. The patient being covered with woollen blankets, should now drink some warm Madeira negus spiced with scraped nutmeg, or some brandy punch; or, instead of the foot-bath, good table vinegar may be thrown on heated bricks and the patient exposed to the vapour: the addition of a bunch of mint or peppermint makes the vapour more agreeable; or the patient may be exposed to the vapour of spirits.

Although in the further progress of the disease I have undoubtedly seen both the warm bath, the warm salt-water bath, and vapour bath, prove useful in various ways, still there are many severe cases in which it may justly be surmised, that notwithstanding every exertion, by their use the heat and circulation of the surface may not

be restored, and that they may do more harm by the fatigue in removing the patient, than otherwise they do good.

In these untoward cases, I think it probable that we might derive considerable benefit by placing the patient in a bed or box, so contrived as to expose the surface of the body, excepting the head, to the action of heated air, or air impregnated with the fumes of some agreeable stimulating perfume, which would have the double advantage of avoiding the fatigue by moving the patient, and the disadvantage of moisture, which when considerable collapse has taken place, I think, by the relaxation which it occasions, is rather hurtful than useful. In the circumstances of which I am now treating, it is not relaxation, but excitement of the capillary circulation on the surface which is necessary, and if this can be effected by stimuli, every one must acknowledge, that none more powerful and universal, or more quick in its effects, than heat can be applied to the human frame.

I frequently found great difficulty in persuading the patients, especially in the more advanced cases, to get into the bath. This repugnance seemed to arise, either from the spasmodic contraction of the toes, or a morbid sensibility of the feet, so that touching the warm water seemed to excite disagreeable feelings. They generally however were

relieved, for a time at least, when they had lain a while in the bath.

Sect. VIII.—*Use of calomel in full doses followed by a mixture of laudanum, oil of peppermint and water.*—Taking a favourable opportunity, a full dose of calomel should now be given, mixed with a little thick mucilage of gum Arabic, the dose of calomel varying from eight and ten, to fifteen and twenty grains, in very urgent cases perhaps to thirty grains, which should be washed down with a mixture of laudanum, oil of peppermint, and water. It is not of much consequence which preparation of laudanum we employ, but the mixture should contain from two to four grains of opium, from five to twenty drops of oil of peppermint, and an ounce and half or two ounces of water, or instead of the oil of peppermint a small quantity of brandy may be substituted.

Sect. IX.—*Caution necessary in the use of stimulants.*—But while we employ these stimulants, we must never forget, that the less we are obliged to use them the better, since the sequel of the disease is marked most undoubtedly by symptoms of a congestive sub-inflammatory character, where they are more likely to be hurtful than useful, and that it is by directing our reme-

dies to the due regulation of the secretory organs, that we must chiefly trust, in counteracting the effects of the disease.

SECT. X.—*Cause of the watery purging and vomiting, and in what light these symptoms are to be regarded.*—I consider the watery purging and vomiting to be the consequence of the great accumulation of blood in the internal parts, and an effort of nature to relieve herself from the oppression thus induced ; wherefore these symptoms are to be regarded as more or less salutary, and therefore are not to be suddenly or hastily checked, supposing this to be in our power, by large doses of opium. If these discharges did not exist, it is not improbable that either serious effusion would take place into some other cavity, or the patient would die apoplectic or convulsed. One case of cholera sicca has been noticed here, where the patient was affected with dreadful convulsions, requiring the power of several men to restrain him, and was thrown into the air from his bed by their violence. On the other hand, it is necessary that the practitioner should endeavour to moderate the purging and vomiting, otherwise nature, exhausted by the efforts which she has made, may sink never to rise again. This is a point of no mean importance in the treatment of this disease.

Sect. XI.—*On the utility of large doses of calomel in this epidemic.*—In regard to the use of calomel, I would advise, that although the English practitioners in India have long been familiarized with twenty grains, or half drachm doses of calomel in inflammatory diseases of the viscera, and that the use of twenty grain doses in the epidemic cholera of India has the support of a great part of the profession there, still, in this part of the world, there seems to exist a strong prejudice against its employment in these doses, occasioned, I have reason to believe, more by fear of some supposed bad consequences than from any actually experienced bad effects of this valuable medicine; nay, I doubt much if those who are so ready to inveigh against it, have ever exhibited a twenty grain dose of calomel in the disease. As I employed calomel during the whole course of the epidemic, in the manner I have described above, I can safely affirm, not only that I did not observe any bad effects from its use, but that, excepting in three cases, it did not even excite ptyalism, nor had any other very evident or immediate effect; but under its use, aided by opium and oil of peppermint, the vomiting and purging gradually gave way, while the external heat and power of the circulation increased; and consequently, it seemed, by rousing into action the secretory organs, to enable the body to free

itself from the internal congestions and vitiated secretions, the effects of the disease. I believe, and have experienced, that twenty grain doses of calomel, repeated with prudence, according to circumstances, will sometimes succeed in saving life under very desperate circumstances, when, in all human probability, there is no hope from any other medicine; and this is saying more than can be affirmed of any other practice or medicine yet known, under the circumstances I allude to. That there are cases which do not require these large doses, and that some may recover without taking calomel at all, I will not deny; but I consider its utility and superiority in this disease so well established, that I should not feel myself justified in omitting its use in any severe case of the disease, where considerable prostration of the vital powers had already taken place; as, under such circumstances, I know no remedy of equal value, or which at all merits to be compared with it.

Sect. XII.—*Scruple doses of calomel useful in inflammation of the viscera.*—Several years ago, in consequence of the recommendation of Dr. Armstrong, I began to use scruple doses of calomel in severe cases of inflammation of the internal organs after bleeding, and have found such practice unequivocally useful. I have sometimes employed two such doses in twenty-four hours.

I have used this practice chiefly in inflammation of the brain and liver; and it appeared to me, that by so doing, the necessity of bleeding was lessened, so that the disease was subdued, with the loss of a much smaller quantity of blood than, in all probability, would otherwise have been necessary. Calomel seemed to produce a change for the better in the state of the patient, without any other evident effect being induced; for they were neither purged nor salivated by it, but the febrile irritation was considerably diminished, and the cases were conducted to a favourable termination without difficulty.

Having convinced myself, therefore, that in this climate, such doses might be used, not only without danger, but with evident advantage in high excitement of the system, I had no difficulty in deciding on trying the Indian practice in the present epidemic; being convinced that the objection against its use, urged by some on the grounds of difference of climate, was more specious than solid; and my experience has fully proved this to be the case; all the difference appears to me to be, that there is less necessity of repeating the doses so frequently, or continuing these large proportions so long as some of the practitioners in India seem to have thought necessary there.

I do not remember having had occasion to prescribe more than three doses of calomel of twenty grains each to any patient, at intervals of

two, three, or four hours; by the time these had been given, symptoms of evident amendment either took place, or the state of the patient plainly showed that he was beyond the reach of medicine; the practice I followed, of assisting the action of calomel by the use of purgatives, might have contributed to render a smaller quantity of that medicine necessary.

Sect. XIII.—*Mercurial friction and fumigation.*—I sometimes employed mercurial frictions, and had I again to treat this disease, would certainly use them more frequently than I did; being convinced, that we have more to fear from not being able to induce mercurial effect on the system, than from the large doses of calomel employed. Every one who has treated this disease, must have observed the great degree of torpor which prevails in the system throughout, in the first period of the disease; doses of the strongest stimulants, and very irritating external applications, produce in it comparatively but little effect; both secretion and absorption are either difficult or suspended. Where life is evidently in danger, perhaps the preferable way would be to employ mercurial fumigation,* even at the risk of quickly

* This mode of employing mercury is recommended by Dr. Christie, who mentions a particular method of employing it as used by the late Dr. Gibson, of the Bombay establishment. The

exciting salivation; which, however, does not appear necessary in the cure of the disease, and may do harm, by the irritation which attends it, and the consequent debility.

The acknowledged powers of mercury in exciting the action of the sanguiferous system, determining the blood to the capillaries, equalising the circulation, exciting the different secretory organs, and correcting the secretions when unnatural, point it out as one of the chief medicines to be used, in obviating the fatal effects to be feared from the congestive oppression of the internal organs, and the torpid state of the superficial capillaries, the consequences of the action of the poison which we believe to be the cause of the disease.

Sect. XIV.—*Auxiliary practice after using the above mentioned means.*—After the use of the above mentioned remedies, the patient should remain in the bath as long as he can do so without fatigue and uneasiness; he is then to be rubbed dry, and being covered with a warm woollen blanket, should be removed to a warm bed, and placed between warm woollen blankets. He should then be well rubbed with dry warm flannels, or with a warm spirituous embrocation, the base of

inhalation of mercurial vapour is also recommended by Mr. Searle. See his work on Cholera, p. 125.

which should be pure ammonia, which being long continued, bottles filled with hot water, or bags with hot sand may be put to the extremities, and bladders nearly filled with a decoction of stimulating, aromatic, and anodyne herbs applied to the belly and pit of the stomach.

Sect. XV.—*Local detraction of blood when to be used; use of pure ammonia, nitric acid, and blisters, or sinapisms.*—In urgent cases, when the pain and uneasiness at the pit of the stomach, and oppression at the lower anterior part of the chest are considerable, and vomiting frequent, should these not soon appear to be relieved by what has been already done, it will be useful to apply ten or twelve leeches to the epigastrium, or to take some ounces of blood from this part by scarifying and cupping it; occasionally it is useful to apply some leeches round the anus, when the abdominal congestion and irritation is considerable; in other cases where danger appeared imminent, and when it was not thought necessary or advisable to bleed locally, I ordered the pit of the stomach to be rubbed with pure liquid ammonia, or the officinal nitric* acid, and then applied a pretty large

* At first I employed the officinal nitric acid of this place, diluted with one-third of water, as recommended by Mr. Powel in the Edinburgh Medical and Surgical Journal, 1820, page 543; but finding that it frequently produced little or no effect, I afterwards used it undiluted.

blister; or sinapisms were laid on this part, or near the heart, and on the extremities.

Sect. XVI.—*Dose of calomel with laudanum and oil of peppermint, when to be repeated, and use of anodyne clysters.*—According to the urgency of the symptoms, a second dose of calomel, with opium and oil of peppermint, was given at an interval of two, three, or four hours, and if it appeared necessary, in the same way a third, the same proportions were preserved, or they were diminished if that appeared advisable.

When the vomiting and purging notwithstanding were obstinate and exhausting, I sometimes found it necessary to use anodyne injections, of a solution of starch in water, with laudanum, of which, from thirty to fifty drops of the Edinburgh Pharmacopœia were used, and when the laudanum given by the mouth seemed to be rejected, opium was given in the form of pills.

Sect. XVII.—*What may be objected to the utility of calomel.*—It may be objected to the practice I have recommended above, that as opium is given after the calomel, the good effects observed may be owing to its use, or to the stimulants with which it was joined.

That considerable advantage is derived by combining calomel with opium and stimulants, in mo-

derate doses, I think there can be no doubt, for I believe that the stomach will more easily retain calomel when given with than without these remedies, independent of other good effects to be expected from their anodyne, antispasmodic, and stimulating properties.

Sect. XVIII.—*Good effects of calomel inferred from what takes place in the progress of the disease towards convalescence.*—But to the practitioner who is accustomed to note the operation of calomel, I need hardly add, that the after part of the disease clearly showed, by the renewal of the secretions, and the discharge of large quantities of vitiated bile, that the calomel had succeeded in assisting the organs to recover themselves, and overcome the effects of the disease.

Sect. XIX.—*Utility of opium.*—In regard to opium, the principal advantage to be derived from its use seems to be its moderating the violence and frequency of the purging and vomiting, the spasmodic symptoms, and general irritation ; and although the violence of the disease, its nature, and rapid progress, often require larger than ordinary doses of this medicine, as well as of calomel, since smaller ones in the first period produce little or no effect, still having in view the congestive and sub-inflammatory symptoms which so frequently follow, as well as the strong probabili-

ty of the serous purging and vomiting being an effort of nature to relieve herself, the less of this medicine which circumstances may require us to employ, so much the better.

SECT. XX.—*Utility of oil of peppermint, stimulants to be discontinued on appearance of reaction, when alterative doses of calomel, with ipecacuanha, or emetic tartar, alternated with purgatives, and sometimes with a small quantity of opium, recommended.*—Oil of peppermint, like all other essential oils, is a strongly stimulating medicine, and although grateful to a dyspeptic stomach, and a useful auxiliary with calomel and opium,* still, by frequent repetition, it,

* The combination of calomel, with opium, and oil of peppermint, which we owe to Mr. Corbyn, is undoubtedly the best internal remedy yet known in the treatment of the first period of this disease; whether or not the large dose of calomel by itself might have the effect of quieting the inordinate state of the system, as some have alleged, I cannot decide, having never ventured to trust the primary treatment to this medicine unaided by opium; but the combination of the three together is certainly as powerful a one, and as well adapted to fulfil our views of quieting irritation, and afterwards rousing the system to defend itself, as can well be imagined. The rapid course and fatal tendency of the disease, indicating the necessity of early treatment, render such a combination of remedies particularly necessary. The reason why both this and every other practice yet known, *must* frequently fail, does not arise from the inefficacy of the remedies, but from the deadly nature of the disease itself, and the cause which induces it, as well as the much to be regretted delay under which the practitioner has so often to prescribe.

as well as other stimulants imprudently used, may contribute powerfully to the evolution of that inflammatory state, which we have to fear in the second period of the disease; let the practitioner then carefully watch the return of reaction, and when it appears, let him gradually withdraw the stimulants which circumstances have obliged him to employ, and let him trust the remainder of the cure to alterative doses of calomel, with ipecacuan, or emetic tartar, alternated with purgatives occasionally, should it appear necessary, adding a small portion of opium; by which practice, the secretions will be kept up, irritation from the presence of vitiated excretions got rid of, and the bad consequences of congestion prevented or removed.

Sect. XXI.—*On the patient's drink.* The patient was directed, while the vomiting was urgent, to drink as little as possible; but when that symptom was moderated, or ceased, he was permitted to take frequently, and in small quantity at a time, an infusion of mint or peppermint, a decoction of barley, and when the thirst was urgent, and the patient himself asked for it, a little cool water by table-spoonfuls, from the use of which I observed no bad consequences.

Sect. XXII.—*Mixture of Magnesia and rhubarb, with peppermint water, Hoffmann's ano-*

dyne liquor, and laudanum, when recommended. When the disease seemed to have been excited by indigestion, or where an unnatural state of the secretions of the digestive organs appeared to exist, I sometimes prescribed a mixture of magnesia and rhubarb with peppermint water, and a small portion of laudanum, and Hoffmann's anodyne liquor, which proved useful.

Sect. XXIII.—*Stimulants and anti-spasmodics when necessary.* This was the general treatment which I employed during the first period of the disease, and when the remedies were used in time, they frequently succeeded in moderating the violence of the symptoms, and in assisting nature to bring on reaction.

When, however, the vital powers had been much oppressed, it was found necessary to aid their languid efforts by other stimulants and anti-spasmodics, such as wine, spirits with water, sulphuric and nitrous ether, Hoffmann's anodyne liquor, musk, camphor, valerian, assafœtida, ammonia, &c.

Sect. XXIV.—*Change in the appearance of the disease when reaction comes on.* When reaction has once begun, the appearance of the disease entirely changes; and it is of much importance at this period to watch the turn it may then take, as the life of the patient will greatly depend

on the judgment of the practitioner, and the timely employment of the means of cure.

Sect. XXV.—*Copious biliary discharge sometimes takes place.* As in idiopathic cholera, (cholera morbus,) nature seems to relieve a difficult and languid abdominal circulation, or a congestive state of the branches of the vena portarum, by a copious biliary discharge, which, as being one of the most prominent symptoms, has given name to the disease; so in this epidemic she sometimes makes the same effort, though seldom; and I generally found it necessary when the primary symptoms of watery purging and vomiting had been quieted, to imitate such efforts of nature, by using the means which appeared best fitted to renew the action of the secretory organs in general, and particularly of the liver.

Sect. XXVI.—*Full vomiting tried.* For this purpose, in a few cases in the earlier part of the disease, I tried the effects of full vomiting, which I found it difficult to excite by the ordinary full doses of ipecacuan and tartar emetic, but my experience of their effects has been too limited to enable me to speak with sufficient confidence on their use; in one case the disease seemed to have been suspended for a time by the effect of the emetic. Unfortunately this patient caught cold,*

* This is the case alluded to, p. 67.

had a return of his complaint, and died; if full vomiting is to be tried, the earlier the emetic is given the better.

Sect. XXVII.—*Cause of vomiting as a symptom of the disease.* From the difficulty with which the stomach appears to be excited by full doses of ipecacuan and tartar emetic to the action of full vomiting, one is disposed to think, that vomiting, as a symptom of the disease, is the consequence of an unnatural accumulation of fluid matter in the stomach, and of anti-peristaltic motion in the duodenum and that organ, rather than of other causes of irritation in the alimentary canal.

In general the patients complained little of pain, but rather of a feeling of internal uneasiness and anxiety: the most severe pain I observed seemed to be occasioned by the spasms of the muscles of the inferior extremities.

Sect. XXVIII.—*Use of alterative doses of calomel and ipecacuan, with and without opium, hyoscyamus, or lactucarium, alternated with purgatives, and what use of purgative clysters.* Towards the farther prosecution of the ideas which I have exposed above, and in fulfilling our third indication, I used alterative doses of calomel, or calomel combined with small quantities of ipecacuan, to which occasionally were

joined a small proportion of opium, hyoscyamus, or lactucarium, alternated with purgatives.

At first I frequently employed castor oil in the form of emulsion, and so combined as to become as little disagreeable to the taste as possible; but notwithstanding this, and even when joined with laudanum, it was often rejected by the stomach, or proved insufficient to open the gall-ducts, so that I found it necessary to employ more stimulating purgatives, such as pills with rhubarb and calomel, sometimes with a proportion of jalap; an infusion of senna with sulphate of magnesia and manna, or the compound extract of colocynth of Reuss's Pharmacopœia, with calomel, sometimes with a small portion of opium.

By one or other of these medicines, I commonly succeeded in procuring a free discharge by stool of very morbid bile of various hue, from very dark green to a pitchy black; sometimes a thick mucous, or yeasty-looking matter was discharged, in others a purulent-looking fluid, or an earthy-looking substance, and in a few cases where in all probability the functions of the liver had been much deranged before the accession of the epidemic, considerable discharges of dark-coloured venous blood, which I conjectured to come from that organ, took place; this, however, did not prevent me from continuing the purgative treatment, which I had already found so useful,

but induced me to take the precaution of employing the least irritating of that class of medicines.

In a few cases the discharge from the bowels towards the end of the disease resembled those of dysentery, consisting of small evacuations of a bloody mucus.

I frequently found it necessary to assist the operation of the purgatives by using purgative clysters, composed of a decoction of senna, in which common or Glauber's salt was dissolved; I never observed that the patients complained of irritation from the use of these, but on the contrary, that they were always much relieved after the bowels had been freely evacuated.

There was no appearance of debility as a consequence of this practice, but an increase of the patient's strength and an improvement in his general health was very evident.

In order to judge correctly of the effects of these medicines, the practitioner himself ought to examine every thing discharged by the patient; if he trusts to the accounts of the attendants, he will constantly be subject to error on this point.

My experience has strongly confirmed the utility and necessity of employing purgatives by the mouth, and purging clysters in this disease: indeed, till they begin to act, no bile in general appears in the alvine discharges, the powers of the body seemed so torpid, that calomel, as I employed it, was insufficient to open the gall-ducts,

or excite the mucous glands to give out their secretions, till assisted by purgatives, of which ordinary doses, of the milder sort, were often insufficient to produce the desired effect, so that I was frequently obliged to use the more stimulating; but while I did so, I frequently conjoined a small portion of opium, so as to guard against too great irritation, and with the hope of counteracting the spasmodic state of the alimentary canal, so evidently and so frequently symptomatic of this disease.

Sect. XXIX.—*Some recovered without much fever.*—Under this treatment a few patients recovered without the occurrence of much fever, or other untoward symptoms, but much more frequently the complaint, on getting to the second period, put on one of the four forms which we have spoken of above, and required active antiphlogistic treatment. General and local bleeding, blistering, diaphoretics, and diuretics, expectorants, &c. were all required, and found useful, combined with the alterative and purgative treatment I have already spoken of.

Sect. XXX.—*Longer or shorter convalescence seemingly depends on a healthy change in the alvine discharge.*—In regard to the time necessary for the complete recovery of the patients, it seemed to depend much on the changes

produced by the treatment on the alvine discharge. When the progress towards recovery was slower than usual, I commonly found, that the health of the patient, at the time he was affected with the epidemic, had not been good.

Sect. XXXI.—*Much attention necessary to local symptoms.*—During the whole course of the disease, much attention should be paid to local symptoms: the most frequent, beside purging and vomiting, are oppression, and sometimes pain at the epigastrium, and lower anterior part of the chest, anxiety, spasm of different muscles, hiccough, uneasiness in the head, pain of the limbs, and in some part, or along the whole course of the spine. As these different symptoms probably depend on the unnatural state of the internal circulation, the changes in the blood, and the undue influence of the nervous power, they ought to be combatted by local bleeding and blistering, warm stimulating or anodyne fomentations, the warm or vapour bath, friction with stimulating and anodyne spirituous embrocations, or *liquor ammoniæ puræ*, and the internal use of opium, musk, camphor, assafœtida, valerian, æther, Hoffmann's anodyne liquor, in guarded doses.

Sect. XXXII.—*Thirst how best relieved.*—Thirst is frequently a troublesome symptom, and probably nothing will tend to relieve it better,

and dilute the thickened blood, than the moderate use of the cool fresh water, which the sick often ask for. While watery vomiting and purging, however, are frequent, they ought to be careful in not drinking more than the stomach can easily bear, otherwise it may tend to increase these symptoms.

Sect. XXXIII.—*Patient's Diet.*—As soon as the circumstances of the case permit, a little light soup prepared from a fowl, with or without rice, or with other grain, and if the patient is disposed, some wheaten bread should be given to him from time to time; but the quantity of these should be small, nor should more solid food be allowed, till, from the state of the digestive organs, it is probable that they are capable of bearing it with safety to the patient. This is a subject on which I find it more particularly necessary to insist, having met with two cases, where relapse took place, from indulging in a larger proportion of very plain food than the stomach was able to digest, soon after the first period of the disease had passed. One of these cases proved fatal, and the other was saved with difficulty.

Sect. XXXIV.—*Pure air and fanning promote the cure.*—How much the placing the patient in a pure atmosphere, and well ventilated

room, may contribute to promote the cure, I need hardly say; in every view of the case its utility is evident. Mr. Searle, in his own case, experienced much relief from fanning, and strongly recommends it.*

NAME OF THE DISEASE, ITS NOSOLOGICAL PLACE AND DEFINITION.

From what has been said in the course of this treatise, it follows, that the name of Cholera is but ill fitted to express the nature of the epidemic on which I have written. This disease, it appears to me, ought to have its place in a system of nosology, rather under the comata or adynamiæ than the spasmi. I regard it as a species of apoplexy or asphyxia, and would propose as its name till a better can be found—asphyxia mephitica, alvi fluxu, epidemica, with the following definition.

Morbus aliquando contagiosus, epidemice grassans; virium vitalium plerumque subita, maximaque prostratio, oppressa debilisque cordis arteriarumque actio; recessu sanguinis a superficie ad interiora, diarrhœa, vomituque serosis, raro bile coloratis; et fibrarum muscularium spasmis, animi facultates parum turbatæ.

* See his work on Cholera, p. 121.

FINIS.

Bo: on Athenaeum in